

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 March 2001 (08.03.2001)

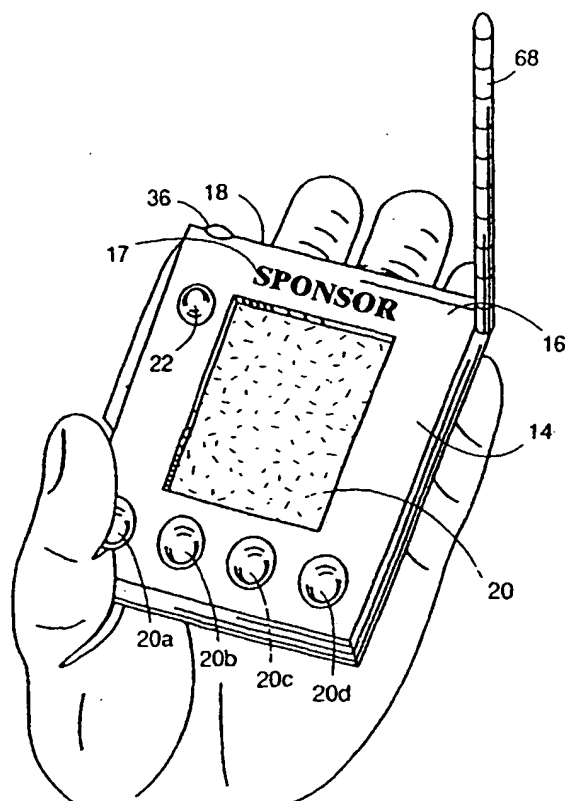
PCT

(10) International Publication Number
WO 01/17262 A1

- (51) International Patent Classification⁷: H04N 7/173 (72) Inventors; and
(75) Inventors/Applicants (for US only): KOPLAR, Edward, J. [US/US]; 500 South Warson Road, St. Louis, MO 63124 (US). CIARDULLO, Daniel, A. [US/US]; 12475 Country Club Drive, Rolla, MO 65401 (US). WITHERS, James, G. [US/US]; 1921 Crampton Court, Chesterfield, MO 63017 (US).
- (21) International Application Number: PCT/US00/24386
- (22) International Filing Date: 31 August 2000 (31.08.2000)
- (25) Filing Language: English
- (26) Publication Language: English (74) Agent: GILSTER, Peter, S.; Greensfelder, Hemker & Gale, P.C., 10 South Broadway, Suite 2000, St. Louis, MO 63102 (US).
- (30) Priority Data:
60/151,840 1 September 1999 (01.09.1999) US
09/489,373 21 January 2000 (21.01.2000) US
60/195,542 7 April 2000 (07.04.2000) US
60/207,460 25 May 2000 (25.05.2000) US
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (71) Applicant (for all designated States except US): KOPLAR INTERACTIVE SYSTEMS INTERNATIONAL, LLC [US/US]; One Memorial Drive, St. Louis, MO 63102 (US).

[Continued on next page]

(54) Title: PROMOTIONAL HAND-HELD COMMUNICATION DEVICES



(57) Abstract: A system for deriving benefits from the reception and processing of composite video signals from a display device by a hand-held device (12), such as a smart card, personal digital assistant ("PDA") or mobile phone. Video signals are modulated with auxiliary data creating composite video signals. The users directs the hand-held device (12) toward the display device by placing leading edge (18) in the path of the video signal. The composite video signals are then transmitted to and received by a hand-held device (12) that auxiliary data is being received. The auxiliary data is then utilized by hand-held device (12). Aiming light and/or audio transducer alert the user of hand-held device (12) that auxiliary data is being received. The auxiliary data is then utilized by hand-held device (12).

WO 01/17262 A1



(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

— Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

Published:

— With international search report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**PROMOTIONAL HAND-HELD
COMMUNICATION DEVICES**

Cross-Reference to Related Application

This application is based upon United States Provisional Patent Application entitled "Interactive Cards and Other Hand-Held Devices for Receiving Veiled Optical Data and Other Signals", Serial No.: US 60/151,840, Filed 1 September, 1999 by Edward J. Koplar, United States Utility Patent Application entitled "Interactive Optical Cards and Other Hand-Held Devices with Increased Connectivity", Serial No.: US 09/489,373, Filed January 21, 2000 by Edward J. Koplar and Daniel A. Ciardullo, United States Provisional Patent Application entitled "Interactive Hand-Held Promotional Communication Devices", Serial No.: US 60/195,542, Filed April 7, 2000 by Edward J. Koplar and Daniel A. Ciardullo, and United States Provisional Patent Application entitled "Method and Hardware for Redemption of a Multi-use Smart Card", Serial No.: US 60/207,460, Filed May 25, 2000 by Daniel A. Ciardullo and Jim G. Withers all of which are herein incorporated by reference and continued preservation of which is requested.

Background of the Invention

The present invention relates to interactive hand-held devices, and more particularly to methods and apparatuses for receiving and decoding modulated signals, for use by a hand-held devices and receiving benefits from receptions of the signals.

The hand-held device of the present invention receive modulated video signals for purposes including enjoyment, promotion, transfer of information, data

collection, commercial verification, security, education, and transactions or verifications at points of sale, as well as other commercial, personal, entertainment, or amusement purposes. Data may be sent to the hand-held
5 device by optical or electrical means. Data may be received by the hand-held device by utilizing a sleeve, cradle, or docking station; through an optical lens, by use of a PCMCIA or alternate computer port, or by FM, AM, or other radio frequency means. Use of the device may
10 allow users to receive, process, and/or store other information and promotional opportunities including access to hotel rooms and facilities and interaction in a movie theater.

U.S. Patent 4,807,031 Broughton et al. ("Broughton")
15 titled "Interactive Video Method and Apparatus" relates generally to in-band video broadcasting of commands and other encoded information to interactive devices. The invention described therein relates generally to interactive educational and entertainment systems, and is
20 described in one embodiment in the context of television program control of toys located where there is a television receiver, as within a residence.

To encode control data capable of providing a benefit to a user, Broughton discloses a novel method of
25 luminance or chrominance modulation of a video signal that creates a composite video signal, whereby the control data is created by modulating the video signal. The novel modulation method alternately raises and lowers the luminance/chrominance of adjacent horizontal scan
30 lines to create a video subcarrier that contains the control data.

Under Broughton, the video signal is not being replaced with other data, nor is the data being added as a separate signal along with the video signal, rather,
35 the video signal itself is modulated to subsequently create the control data. Therefore, the control data is a part of, or contained within, the video signal. The

encoding method also includes preview and remove circuitry to ensure suitability or the presence of data encoding and removal of data encoding, respectively.

5 The control data is transmitted either by television broadcast means, or by pre-recorded video players that are connected to a video display. The control data is then received by the video display where a video field of the video display is modulated by control (i.e. auxiliary) data. The control data is then detected with
10 either opto-electronic or RF (radio frequency) detection means that discriminate the program material from the control data. The detected control data is further reproduced such that the control data can be used with an interactive device.

15 A practical example of a device as described above is the commercially-sold hand-held game device for receiving and detecting such control data has been called the "Wheel of Fortune" ITV Play-Along Game, intended to be used at while viewing a television program
20 presentation of the famous television show of the same name. The device, produced under license by the assignee of Broughton, was a palm-sized device and included a photosensor within a case of the device that received the video signals. The device then discriminated control
25 data from the video program material and caused a liquid crystal display ("LCD") on the face panel of the toy to present portions of a word puzzle, allowing the holder of the device to play the game along with a contestant or to play in response to a videotaped presentation of the
30 game. The "Wheel of Fortune" interactive television (ITV) game together with its hand-held control device including keyboard was commercially available in 1988.

An improvement on the method of modulation described in Broughton is described in U.S. Patent 6,094,228. In
35 Ciardullo et al. ("Ciardullo") improved methods of modulation are disclosed. Data is inserted on the visual portion of a video signal by changing the luminance of

paired lines in opposite directions, thus allowing allow larger amounts of data to be modulated in a signal. Broughton and Ciardullo are both incorporated by reference herein.

5 Efforts by others to provide hand-held devices capable of receiving transmission of modulated data from a video display are represented by U.S. Patents 5,594,493; 5,761,601; 5,767,896, 5,907,350, and 5,953,047. Of these, patent 5,907,350 discloses a method
10 for storing data on a so-called smart card, which is contended to receive, decode and store encoded data signals comprising redeemable coupons said to be embedded within television segments and transmitted along with normal television segments. The device of Patent
15 5,907,350 is a hand-held unit that receives luminance signals from the television display in accordance with the principles of Broughton. The received video signals are decoded and stored within the card for future use. An LCD readout enables Universal Price Codes ("UPC")
20 corresponding to the stored data. A scanner reads the UPC codes at a redemption site, and the stored coupon is then erased from a memory of the card. A microprocessor channels the decoding and storage aspects, and a keypad allows use and input.

25 The term "smart card" as used in the above patents, connotes a hand-held, portable device, not conceptually different from the above-mentioned "Wheel of Fortune" ITV game device. However, the term does not only apply to those patents.

30 As a generic term, "smart card" gradually has come to mean a card that looks like a credit card but includes a microchip or microprocessor embedded or incorporated into the card. The smart card may be referred to as a "fingerheld" computer, typically including a data storage
35 media ranging from less than a kilobyte up to a megabyte (if not more), and are said to have originated in France. Ognibene, P.J., "Card Smarts," Technology Decisions

(July, 1999). Smart cards may, according to a line of reference, also be called "chip cards."

While the hand-held devices of the present invention may be in the form of a smart card, they may
5 alternatively be in the form of mobile phones. Recently, mobile phones have become equipped with increased capacity to store and process information and many such phones are now offering limited network or Internet
10 access, often called wireless Internet access. Industry experts estimate that by 2002, more than 100 million mobile phones will have Internet access in some fashion and that by 2003, more than 1 billion mobile phones will be in use worldwide. Such mobile phones, with or without Internet access, become powerful promotional tools when
15 appropriately modified or connected to receive auxiliary data.

The personal digital assistants ("PDAs") are another hand-held device capable of providing users with promotional opportunities. The most popular brand, Palm
20 Pilot, introduced its first PDA in 1996. The latest Palm Pilot introduced in 1999, Palm VII, was the first PDA to include wireless Internet access.

PDAs and mobile phones, while capable of Internet access, as of the time of this invention have limited
25 functionality as a result of slow transfers of data and limited displays. It is thus desirable to provide users of such devices and similar devices such as smart cards interactive opportunities that are compact in size yet rich in content to encourage users to participate in
30 various promotional opportunities without having prolonged delays in receipt and processing of information. It will be appreciated that under the present invention, that the smart card, mobile phone, and PDA are all capable of providing the promotional
35 opportunities described in the present application.

Hand-held devices that receive optically encoded data from a display device can be efficiently utilized at

a POS without the need to scan a UPC code that is displayed, for example, on an LCD. The hand-held devices and methods may not require additional hardware or software at the POS and must be capable of providing a high degree of security. Additionally, check-out time must not be seriously degraded and multiple promotional opportunities or coupons must be redeemable.

For purposes of the present invention, the term "card" means an interactive device of portable character, preferably of hand-held type which may be carried in the palm by a user, between fingers of the user, or is otherwise intended to be easily grasped and handled manually by the user, including credit card-like devices.

To the extent that they are used in the present description relative only to inventions herein disclosed and/or claimed, the terms "interactive device," "card," "interactive card," "smart card," "optical card," are used interchangeably.

The term "sponsor" is used herein in its broadest possible sense, and may include without limitation entities that issue the hand-held devices and entities that accept them or provide redemption services for users of the cards. Sponsors may also include health care and medical institutions and other service or eleemosynary organizations.

The term "computer" is used herein in its broadest possible sense, and may include without limitation a laptop computer, personal computer, mobile phone, personal digital assistant, or other computer like devices.

Summary of the Invention

Among the several objects, features and advantages of the invention may be noted the provision of interactive hand-held devices for carrying out various modes of novel and commercially advantageous signaling, information-transferring, and value-indicating methods.

The hand-held devices of the present invention are portable devices such as smart cards, mobile phones, and personal digital assistants ("PDAs"), which contain means to receive auxiliary data. The hand-held devices, to
5 provide some of the promotional opportunities described herein, preferably have means to connect to the Internet, which may be referred to herein as "network access", "wireless access", "Internet access" or "wireless Internet". These hand-held devices react from
10 the reception of auxiliary data from sources including radio transmissions, computer systems, video recordings, video transmissions or other sources for reproduction of video, audio and/or other data. The hand-held devices, which preferably contain optical or electrical detection
15 and decoding means, respond to auxiliary data received from a video display. All video displays, whether a television set or monitor, television-like, or image-presenting display device capable of displaying an image containing a modulated video signal, may in the present
20 specification be collectively referred to simply as "display devices."

Signals are received, detected, and reproduced by the new hand-held devices for various purposes including: enjoyment; promotion; coupon or prize validation;
25 advertising by sponsors; advertising verification and polling; transfer of information; data collection; commercial verification; security and access; education; game playing; transactions, verifications, or redemption by sponsoring entities or related commercial locations at
30 points of sale including the Internet; other commercial and non-commercial purposes.

Transmission of auxiliary data to the hand-held devices is encoded using a system of video modulation, preferably as described in Broughton or Ciardullo, but
35 alternatively by other known methods in the art including through the use of the vertical-blanking interval (VBI).

The video signals may be transmitted to the display

device by means of a broadcast, cable, satellite or home video.

Other objects, features and advantages of the invention include:

5 A method of television interactive advertisement and promotion signal transmission using interactive hand-held devices in such a manner that both the mode of transmission of information and the display of received information and/or value indicative thereof will attract
10 viewers' attention, stimulate viewers to watch a transmission (which may be commercial advertising), and effectively entice viewers to respond and take action in response to its reception, as well as achieving the foregoing usage purposes.

15 Thus, there is described herein a system which includes:

A method of such signal transmission that is cost effective, brand efficient, and fun for users of the new interactive hand-held devices;

20 A method of such signal transmission using interactive hand-held devices which effectively increases customer awareness, retention, and differentiation of advertisers' messages and products;

25 A method of such signal transmission using video interactive hand-held devices which allows viewers of television (or video) presentations, including advertising, to directly interact with the devices (such as television receiver or display);

30 A method of such signal transmission using interactive hand-held devices that builds store (point-of-sale) traffic, fosters consumer loyalty, and gives viewers a reason to pay more attention to a company's products, services and advertising;

35 A method of such signal transmission using video interactive hand-held devices which allows viewers of television (or video) presentations, including advertising, to upload received information to a computer

which displays and uses relevant Internet addresses, textual information or code, and other promotional information usable by a computer or computer-like device; and

5 Hand-held devices of the invention are intrinsically simple, effective and economical to make and distribute widely, and are reliable and easy to use.

 The following are merely illustrative of some of the advantages and objects which the new system provides:

10 television advertising response determination;
 interactive advertising and promotions; attraction of viewers' attention; effectively increase consumer awareness and retention of commercial advertising, messages, announcements, promotions, and specific
15 products and services; increased customer differentiation of products and services; stimulation of viewers to watch commercials; increase of store traffic in response to commercial messages; fostering of consumer loyalty; enhancement of viewer involvement in program content,
20 including commercials; enhancement of viewer retention of the content of commercial and other messages; enhancement of the value of commercial messages; increased product/service sales; saving of advertising costs; acceleration of response time of customers following
25 delivery of commercial messages; verification of contests and awards; enhancement of viewer retention of the related website domain names; reduction of barriers related to e-commerce opportunities; additional and sometimes instant rewards and information obtainable via
30 the Internet. The uses and advantages are more fully developed in the following description.

 Briefly, herein described is a system using hand-held devices that derives benefits from the reception of auxiliary data. Auxiliary data is encoded by modulation
35 of a video signal, thereby creating a composite video signal consisting of auxiliary data and continuous video

program data. The composite video signal is transmitted to and displayed by a display device.

The preferred method of receiving auxiliary data when the hand-held device is a smart card is by optically
5 detecting and extracting auxiliary data on the smart card. The user first positions the optical receiver of the smart card so that it is capable of receiving video signals from the display device. The smart card, when actuated and appropriately positioned, begins receiving
10 video signals. Circuitry on the smart card discriminates whether auxiliary data is present in the video signals (i.e., where the video signals received are composite video signals). If auxiliary data is present, the hand-held device reproduces the auxiliary data for its use.

15 The preferred method of receiving auxiliary data when the hand-held device is a mobile phone or PDA is by detecting and electronically extracting the auxiliary data from the video signal by use of a decoder box. The decoder box has circuitry that determines whether
20 auxiliary data is present in the video signal. The box then transmits the reproduced auxiliary data to the mobile phone/PDA by RF, IR, PCMCIA, or wire transfer. These methods of data transfer are faster and more reliable than optical transmission, and reception data
25 may then be transmitted faster. The box preferably receives the video signal from its source by use of RCA jacks, but may otherwise receive the data through other methods such as through use of super VHS, fire wire, or coaxial means, or may be connected to an RF antennae,
30 integrated into part of the circuitry of the television, or be connected so that the decoder device can receive the video stream.

The auxiliary data, when present, is transmitted from the decoder box to the hand-held device.
35 Transmission to the hand-held device occurs preferably through RF, so that the hand-held device need not be aimed at or physically connected to the decoder.

However, other various methods including IR transmission and direct connection through a computer interface such as a PCMCIA port are likewise capable of receiving transmissions from a decoder box. The decoder box may
5 also function as a two-way device, and may receive information from the mobile phone/PDA. The decoder box may, with an appropriate graphics rendering unit, display information received from the mobile phone/PDA on the screen. As an alternative to or in addition to the
10 mobile phone/PDA having network access, the decoder box may alternatively contain network access. The decoder box may additionally contain means to control various devices such as the VCR. Users, upon receipt of information such as a television schedule on their hand-
15 held device, may transmit a request to the decoder box or VCR to schedule recording of a television program. It will be appreciated in the art that although the optical method is preferable for smart cards and the electrical method is preferred for mobile phones and PDAs, both
20 methods are interchangeable and may be used for any hand-held device under the present invention.

Among the several methods herein described may be noted a method of video interactive advertising and promotion, comprising normal television programming
25 content modulated to contain auxiliary data, where the auxiliary data is associated with a sponsor and carries information of special significance relative to the sponsor and of special value to television viewers, distributing interactive devices of hand-held character
30 to television viewers for their use and convenience, the devices being capable of selectively receiving auxiliary data or receiving and decoding composite video signals, providing incentives for viewers to use the interactive devices for obtaining the auxiliary data by rewarding the
35 viewers with information of special value, the interactive devices being capable of retaining indication of having received the information, and providing

redemption of the special value for users at a redemption site where users may present the interactive devices.

When auxiliary data is reproduced by use of the card, various possible signals, indications, display readouts, or other interactive events provide the user with a benefit according to content of the auxiliary data. For example, a series of electroluminescent (EL) indicators may operate in sequence to signify coupon value. A LCD readout or other visual displaying device may present information to the user or give notice of value received. Bonus points may be collected and retained on the device. Text, code, or other data may be transferred to a connected computer for which information may be displayed or executed on that computer. In a use of the device in conjunction with a sports presentation, users may receive on the hand-held device's alphanumeric display current sports statistics, including exemplarity, a batter's batting statistics. In a use of the device in conjunction with a car racing presentation, users may receive on the hand-held device's alphanumeric display the lap data, position, speed of a race participant, or other statistics from a racing event. Such statistics may be delivered in real time or delayed. In user of the device in conjunction with hotel access, additional access to rooms and facilities may be available for the user, of which an indication may appear on the LCD.

The hand-held device may have additional capabilities for promotion and interactivity which are preprogrammed or programmed via user input. Such capabilities may include demographic or user information, which may be used in various applications of the hand-held device by a user or sponsor of the device. The hand-held device may also be used to make or facilitate purchases of items.

The design of the hand-held devices are typically in the shape and form of smart cards, palm devices, or mobile phones. The exterior design of the hand-held device may contain indicia of recognized athletes, teams, products or other figures, and the collection of data

located on the card entice users to save, collect, and trade the cards, such as in a rotisserie league. Additionally, other hand-manipulable devices of a similar size and nature that are capable of receiving and processing auxiliary data as described herein are also within the scope of this invention and may receive data by either the electrical or optical methods as appropriate or as is desired. Thus a stuffed animal or toy, snapshot-type camera, replica sports helmet, scaled racing car, or a replica baseball bat with proper circuitry may process the data as a hand-held device of the nature described herein.

Another feature of the present invention is an optional computer interface port. The hand-held device facilitates transmission between the device and other hand-held devices, computers, and other computer-like devices. In promotional applications of the hand-held device requiring Internet access, if the device cannot transmit data and information through the Internet directly through wireless means or other direct connection to the Internet, it may connect to the Internet through use of a computer interface port. Television viewers, upon watching commercials, programs, or movies, use the hand-held device to obtain opportunities for e-commerce or informational purposes. The information may then transferred to computers or computer-like devices where it may be used for informational or promotional opportunities. For example, a talk show may have a discussion about endangered animals. Informational or promotional opportunities such as available books or videos relating to those animals, along with information relating to how viewers may learn more information from a given Internet website, are transmitted in composite video signals received by the hand-held device.

The opportunities are transmitted as the content of the auxiliary data with the composite video signal, and

when the hand-held device is a PDA or mobile phone, is preferably electrically detected and discriminated by a decoder box, and then transferred by RF to the hand-held device for its use. The auxiliary data may also be
5 transferred by other known means including by IR and through direct wiring. Alternatively, the auxiliary data may be optically detected and reproduced by the hand-held device, which is the preferred method of receiving the auxiliary data when the device is a smart card. As a
10 further alternative, the auxiliary may be detected either optically or electrically, and then transferred to and discriminated by hardware or software of a connected computer or computer-like device.

In some of the promotional applications, the
15 opportunities are transmitted with the composite video signal and are preferably optically detected and reproduced by the hand-held device and then transmitted to a computer by an interface. However, the auxiliary data may alternatively be electrically detected by a
20 decoder device, transferred to the card and discriminated, and then transferred again to a computer via an interface. As a further alternative, received composite video signals may be transmitted from the hand-held device to a computer by an interface, where the
25 auxiliary data is discriminated and the opportunities are then detected and reproduced by the computer. By any of the methods described herein, the opportunities once available to the computer can be stored and used, such as for e-commerce or information collection.

30 When appropriately connected, the stored information from the computer-interface card is uploaded (when appropriate) to a computer for processing and fulfillment. The information received by the computer includes a web page, Internet address or Uniform Resource
35 Locator ("URL"), Hypertext Markup Language ("HTML") or similar textual information or code that can be displayed to or executed for a user. This information provides a

means for the user to obtain benefits through interactivity, and for the sponsor to provide promotional information to the user.

Devices and methods are provided under this invention which allow an electronic coupon to be redeemed at a point of sale using existing point of sale "(POS") hardware and software. In addition, the coupon can be configured to be used only once and with a reasonably high degree of security. Furthermore, check out time is not seriously degraded and multiple coupons may be redeemed at the same POS with relative ease. One method of using the card at a POS, involves the user giving the hand-held device to the cashier. The cashier then locates the correct coupon or redemption value on the hand-held device using a scrolling function in combination with the LCD. The hand-held device is then held such that the LCD is facing towards the cashier and the photodetector faces the bar code scanner. The "redeem" button is then pressed, and the photodetector on the hand-held device passes over the bar code scanner. The timer in the hand-held device resets the device to non-redeem mode if a scan is not detected within thirty seconds. When the scanning laser light is detected by the hand-held device, the device beeps and a numeric code is displayed which may correspond to a stock keeping unit (SKU) number or other information regarding receipt of product shipment, inventory, and/or stocking. Other codes, including an additional numeric code such as the serial number of the hand-held device or a security code can also be displayed. The cashier then enters the numeric code or codes and the appropriate discount or value is applied to the purchase of the consumer. The timer may also delete the coupon if the hand-held device is scrolled to the next coupon, or if the device is powered down and then powered up again. The coupon may also be erased either automatically or manually by pressing predetermined buttons on the hand-held device.

Various other methods of the invention are set forth in the following description and claims. Similarly, other objects and features will be apparent or are pointed out more particular herein below.

5

Brief Description of Drawings

FIG. 1 is a perspective view schematically illustrating use of any of several embodiments of an interactive card in accordance with and embodying the present invention.

FIG. 2 is a perspective external view of a first embodiment of an interactive card in accordance with and embodying the present invention.

FIG. 3 is an external view of a second embodiment of an interactive card of the invention.

FIG. 4 is a perspective external view of another embodiment of an interactive card of the invention.

FIG. 5 is a perspective view of internal features of the interactive device of FIG. 4 of the embodiment of FIG. 4 showing an interactive card of the invention.

FIG. 6 is a perspective external view of another embodiment of an interactive card of the invention.

FIG. 7 is a perspective view of internal features of the interactive device of FIG. 4 of the embodiment of FIG. 6 showing an interactive card of the invention.

FIG. 8 is a schematic diagram of circuitry that may be used to provide various embodiments having circuit features evident in this diagram.

FIG. 9 is a schematic diagram of other circuitry that may be used to provide various other embodiments.

FIG. 10A is an external view, from a user-opposite position, of one surface of yet another embodiment of an interactive card of the invention, termed a camera card, showing the camera-like surface of the card during use.

FIG. 10B is reverse view of the camera card of FIG. 11A, showing an opposite surface of the card on which user display and controls are provided.

FIG. 11A is an external view of another embodiment of an interactive card or device of the invention, showing a surface of the card that is camera-simulative as according to FIG. 10A, and where again the card or

device simulates the form of a hand-held camera, and is also referred to as a camera card.

FIG. 11C is reverse view of the camera card of FIG. 11A, showing an opposite surface of the card on which user display and controls are provided.

FIG. 12 is an external view of the camera card embodiments of FIGS. 10 and 11, showing how the camera card is used, as by sighting through a viewfinder of the card.

FIG. 13A is a perspective view of yet another embodiment of an interactive card of the invention, and referred to as a sports card.

FIG. 13B is a front view of yet another embodiment of an interactive card of the invention, and referred to as a sports card.

FIG. 14 is a block diagram of other circuitry that may be used to provide various other embodiments.

FIG. 15 is a block diagram of other circuitry that may be used to provide various other embodiments.

FIG. 16 is a block diagram of other circuitry that may be used to provide various other embodiments.

FIG. 17 is an electronic/optical signal detection circuit.

Corresponding reference characters identify corresponding elements throughout the several views of the drawings.

Description of Inventive Embodiments

Referring to FIGS. 1-3, in a system of the invention, and in accordance with the various methods herein described, composite video signals are received and projected by a display device 10, to be received by a first embodiment of an interactive hand-held device of the invention 12. Display device 10 is representative of a television screen, video monitor or other video display, movie screen, computer monitor, video-converted display or video-like display, capable of receiving

analog or digital video or video-representative signals from a suitable source, such as a television transmitter, a videotape, streaming video servers, a Digital Versatile Disc ("DVD"), or the computerized display representation of such a source of image content. For present purposes, however, it will be assumed that display device 10 is a kinescope or other conventional type of television display or monitor (which may, of course, include multiple or single-beam types of projector displays).

Thus, display device 10 may schematically represent a video display for displaying video signals but may alternatively be any sort of electron gun, active, array or passive array display device capable of providing not only imaged information in a visible mode but also auxiliary information (e.g., data) in a substantially transparent mode. Display device 10 may be further characterized as a computer monitor or display, as well as a portion or window of such display device. Display device 10 may also be a high definition or digital television, or other digital video presentation device. Video signals include those delivered by microwave relay, satellite retransmission or cable, streaming and other types of downloadable or viewable computer video presentations, and those generally made available by wired or wireless methods.

The new interactive hand-held device 12 may be in the form of any type of hand manipulable device such as a smart card, cell phone, PDA, or other palm like device and is illustrated in FIG. 1 as a smart card. Hand-held device 12 may be held in the palm or between the fingers of a user in the generally vicinity of display device 10, typically within the same room and, when necessary, suitably oriented so that the device 12 optically receives light from a visual representation of the video signal from the display device. When hand-held device 12 is a PDA or mobile phone, it is preferably configured to receive RF transmissions but may alternatively receive

other signals such as IR, and should be suitably oriented or connected to receive the auxiliary data or other signals from a decoder box. When hand-held device 12 is a smart card, it typically is within the same room and
5 suitably oriented so that the card can receive light from a visual representation of the video signal from the display device.

Hand-held device 12 is depicted in FIG. 2A as a PDA and show in a manner in which it may be held and used.
10 Hand-held device 12 may include a PDA-sized housing 14 that encloses various circuits and circuit components ("Circuitry") of the device. Hand-held device 12, when in the shape of a smart card (as will be further shown in FIG. 2C), may be thicker than a credit card as desired or
15 as needed to contain within housing 14 circuitry for carrying out functions as described below. Housing 14 may be of any hand-held shape desired that is functional and hand manipulable, examples of which include a PDA (as shown), cell phone, PCMCIA card, snapshot-type camera,
20 replica sports helmet, replica baseball bat or football, or scaled racing car.

On front surface 16 of hand-held device 12 is an imprinted brand name of a sponsor 17, and possibly information or indicia that may induce a user to
25 associate device 12 with a particular sponsor 17. When hand-held devices 12 are inexpensive to manufacture, such as when they are in the form of smart cards, imprinted sponsors 17 may be found with higher frequency. However, when hand-held devices 12 are the user's personal device
30 such as a cell phone or PDA that have primary uses other than receiving promotional opportunities, such indicia may not be included. Sponsors 17 may include various entities such as advertisers, Internet websites, television shows, other occurrences, programs or events,
35 for which use of the device will provide interactive opportunities. Sponsor 17 may be a company providing the hand-held device 12 to a user of its service, such as a

hotel, phone company, PDA service, or place of business, that uses device 12 for access, privileges, and/or rewards.

5 A leading edge 18 of the hand-held device 12 in PDA-like shape may include an RF antenna 68 to receive auxiliary data as is described herein below. Visible from front surface 16 of the device is a visual display 20, of which alternatively or additionally may be light-admitting diodes or other electro luminescent light
10 sources 20a, 20b, 20c, and 20d as shown in FIG. 2B. Hand-held devices 12 have various users controls and may include a keypad or touch screen (not shown) to allow user input for specific functions and additional uses.

Hand-held device 12 is depicted as a smart card in
15 FIG. 2C in a manner in which it may be held and used. Hand-held device 12 includes a credit card or wallet-card-sized housing 14 that encloses various circuits and circuit components ("Circuitry") of the device. Housing 14 of hand-held device 12 may be thicker than a credit
20 card as desired or as needed to contain within the circuitry for carrying out functions as described below.

Housing 14 may be of any hand-held shape desired that is functional and hand manipulable, examples of which include a PCMCIA card, snapshot-type camera, replica
25 sports helmet, or scaled racing car.

A leading edge 18 of hand-held device 12 may include a lens or small aperture 36 to admit video signals to a photosensor within housing 14, as is described herein below. Visible from front surface 16 of hand-held device
30 12 are a plurality of light-emitting devices 20 which may be light-admitting diodes (LEDs) or other electro luminescent light sources, including, for example, regions of a LCD of either active or passive type.

A typical manner in which hand-held device 12 is
35 used and the lights are operated is as follows: A user watches a television presentation such as a commercial, television program, movie, or other video-displayed

program. When such a presentation is displayed, the user may then hold hand-held device 12 as shown in FIG. 2B or 2C. The user positions hand-held device 12 so that leading edge 18 of device 12 will be in a position for receiving video signals from display device 10. Hand-held device 12 or display device 10 may have indicia informing the viewer to press the pressure membrane or button 22 at a preferred time, such as when a commercial of a sponsoring entity appears. Although the term "button" is used herein, it is considered to include membrane switches, pressure or touch regions capable of activation and carrying out the function of a button. When the user presses button 22, the video signal will be detected and received by a photodetector (the process to be described below) within housing 14. The composite video signal comprises a video signal modulated with auxiliary data, in accordance with the teaching of the above-referenced Broughton and/or Ciardullo each of which are herein incorporated by reference. A discriminator, implemented by circuitry of hand-held device 12 determines whether auxiliary data has been transmitted along with the video signal of the presentation.

However, the video signal may be received by a decoder box which then discriminates the auxiliary data and transfers it to the hand-held device 12 by RF or by other means including IR or a computer port and direct wired connection. The received video signals may be sent through an interface (to be described below) of the hand-held device 12 to a computer or computer-like device where the discrimination of auxiliary data may be implemented in the computer's hardware or software.

If the discriminator determines that the transmitted video signals contain auxiliary data or auxiliary data is received, the circuitry of the hand-held device 12 may then cause an audio transducer 34 present on the printed circuit board to sound a tone or "beep", providing assurance that the auxiliary data has been received

satisfactorily. A suitable aperture may be provided on the front or rear surface of hand-held device 12 to allow sound to pass from audio transducer 34.

Hand-held device 12 may contain more advanced means of providing sound to a user. Hand-held device 12 may contain advanced sound circuitry so that the device can play digital audio signals comprising songs or instruments. The songs may be prerecorded to hand-held device 12 and may be triggered upon proper notice, or they may be downloaded in delayed or real-time and thereafter be played. Thus, versions of hand-held device 12 that are capable of music may synchronize songs through multiple devices by transferring and receiving information from the other devices 12, along with optional source of the auxiliary data.

The circuitry of hand-held device 12 may also cause operation of one or more of lights 20a, 20b, 20c, and/or 20d of FIG. 2B or FIG. 2C, to indicate a value (whether it be a discount, prize, coupon, or item) that has been received. For example, one light 20a may entitle the user to a free beverage at a sponsor's store location. Two lights 20a and 20b may indicate a substantially larger coupon value, such as a twelve-pack of a beverage.

A coupon value causing three lights 20a, 20b, and 20c to be illuminated may indicate entitlement to a grand prize, such as a free supply of a beverage for the lifetime of the user. The term "light" is intended to mean any kind of display useful for conveying a signaling or indicating purpose visible to the user.

It is also possible to use the lights 20a, 20b, 20c, and/or 20d of FIG. 2B or FIG. 2C in alternative methods to confer benefits from reception of auxiliary data. For example, different colored lights 20 may be used with each color representing a different prize or different value. Alternatively, hand-held device 12 may be programmed to operate so that a light 20 shows each time a different commercial of a sponsoring entity is shown,

so the user will have inducement to watch multiple commercials to be entitled to a prize or benefit.

The hand-held device and lights 20a, 20b, 20c, and 20d operates in the following manner: During a commercial or at the appropriate time, a user pushes button 22 to receive video signals by a preconfigured hand-held device 12. If the appropriate auxiliary data was present in the received video signal, hand-held device 12 then validates the receipt of the auxiliary data by illuminating a first light 20a. During a further commercial a second light 20b illuminates. During a third commercial a third light 20c illuminates, and during a fourth commercial presentation, light 20d illuminates. The user may then appropriately present hand-held device 12 at a vendor location, redemption center, or Internet website to determine if the device is one for which a special prize is to be awarded. If hand-held device 12 does not entitle the user to the special prize, a consolation or alternative prize may be made available. A different variation of illumination of signal lights 20a, 20b, 20c, and/or 20d may entitle the user to alternate consolation or other prize.

Alternatively, the lights may work in the following manner: During each quarter of play, when a commercial appears the user may press button 22. When auxiliary data has been successfully received (by the process of which is described above) from the commercial sponsor 17 of an event or of hand-held device 12, the first light 20a will be illuminated to indicate receipt of the commercial during the first quarter. Such operation will continue through successive quarters until all lights are illuminated. The user may then present hand-held device 12 to a store or point of sale operated by the commercial sponsor 17 to receive a prize or grand prize, depending upon the configuration of device 12. Or, the user may be rewarded in accordance with how many lights 20 are illuminated. Then, the user may thereafter tender hand-

held device 12 for value redemption, or may present it, for example, at a lottery at which the devices 12 may identify the user's name by users, and where the device 12 is drawn.

5 The store location, point of sale, or sponsor's website may include means for resetting hand-held device 12 so that it may be used again in a similar manner during a future presentation. Such means may include leaving indicia of a previous award reception on hand-held device 12, such that a user may only redeem their benefit a limited number of times or for a limited duration. Hand-held device 12 may have a code on the back such that a redemption center may verify that the receiver of the benefits of device 12 was in fact
10 entitled to receive them and that device 12 has not been modified to receive an unauthorized benefit.
15

It will be appreciated from the foregoing that viewers using hand-held device 12 may be induced to watch a presentation that they might otherwise not be so
20 inclined. The inducement may span a series of commercials, causing users to watch presentation after presentation, as during successive days or weeks. Also, advertisers may make a better determination as to who has been watching and paying attention to their commercials.

25 When users return or bring in hand-held device 12 to the benefit redemption center, advertisers will have knowledge of how many people actually took advantage of the promotion. The hand-held device 12 not only induce the viewer to watch a commercial, but also induces
30 viewers to visit a sponsor's place of business, point of sale, or Internet website at which they may receive the value indicated by hand-held device 12 indicated by a visual display 20 such as the lights 20a, 20b, 20c, and/or 20d or a code displayed by LCD 44 of hand-held
35 device 12.

Another example of use of hand-held device 12 is as follows: On a television broadcast, the announcer

discloses last minute air fare specials indicating available flight times and cost. The video signals are modulated to contained auxiliary data with flight information. Interested users capture the auxiliary data
5 containing their selected flight opportunity. After receiving the data, users may view the opportunity directly on LCD 44 of the hand-held device 12, or alternatively be provided with a special Internet link to the opportunity. Users with Internet access may purchase
10 the opportunity directly, for which they may receive a confirmation for the ticket purchased. Users without network access may connect hand-held device 12 to a computer with Internet access to access the airlines Internet website, verifying the availability, the cost,
15 the flight information, and the restrictions to complete their purchase. Alternatively, users may be required to arrive at the airport on a first come first served basis to complete their purchase and take their flight much as a last minute stand-by passenger makes a ticket purchase.

20 There are various incentives for a user to watch a sponsor's televised presentations including commercials, which include amusement or information of value to the user. For example, during each quarter of a game, a user would view commercials to obtain an indication of
25 participation by means of lights 20a, 20b, 20c, and/or 20d during the successive quarters. The user knows they may take hand-held device 12 to a POS operated by the sponsor and receive a prize for having watched. Common advertising strategy for sponsors of major sport events,
30 such as "bowl" games, is to provide a presentation during each quarter of the game.

During nationally-televised "super" events such as the well-known Super Bowl, World Series and "bowl" games, increased viewer ratings induce advertisers to provide
35 impressive commercials to which users will not only pay attention but will also interact, watch, participate, and be favorably impressed by such commercials. Hand-held

devices 12 when used during such televised presentations offer advertising sponsors an unparalleled opportunity for promotional activity and for assuring audience participation, as well as providing an exceedingly effective methodology and means by which the percentage of successful viewer watching and product/service interest may be measured.

Multiple advertisers may use hand-held devices 12 for either the same event or for multiple events. For example, if a commercial is presented during a television show relative to a first sponsor's product 17 or service (such as relating to automobiles) with which there is a relation to a second sponsor 17 (such as bank providing financing for the sale of those automobiles), hand-held device 12 may be especially adapted by its resident instruction set to be "co-branded," so as to respond to both sponsor's presentations. The co-branded hand-held device 12 may be used to provide special inducement such as through a prize or other value upon presentation at a bank, a dealer, or Internet website affiliated with or sponsoring the commercial presentations. Many other co-branding possibilities for hand-held devices 12 and their usage will be evident.

FIG. 4 illustrates features of hand-held device 12, including the provision of aiming light 24 on the face of the hand-held device. Aiming light 24 is typically included on embodiments of hand-held device 12 where video signals are optically received by device 12, such as to indicate that device 12 is positioned such that it is capable of capturing video signals emanating from a display device 10. When button 22 is pressed while the leading edge 18 of hand-held device 12 is generally oriented toward display device 10, received composite video signals cause illumination of aiming light 24 to indicate that video signals are being received. Aiming light 24 illuminates for so long as data is being received, for a predetermined period of time sufficient

to indicate that hand-held device 12 is oriented or aimed correctly, or for a long enough time period as to enable the encoded signals to be received by device 12. Aiming light 24 may be included on embodiments of hand-held device 12 where the video signals are electrically received to alert the user that auxiliary data is being received through IR, RF, or the computer interface.

Referring to FIG. 5, the internal features of hand-held device 12 are illustrated. They may be seen to include a printed circuit board 26 having integrated circuits 28 including push-button 22 and aiming light 24, which may for example be a LED. The circuit board includes at an appropriate location, an optional photocell 30. Photocell 30 is appropriately oriented so that it may receive light through a suitable aperture 36 (not shown) along leading edge 18 of hand-held device 12, which aperture 36 may be at a location as shown in FIG. 3. The circuit is powered by one or more batteries 32 or other suitable cells (not shown), intended to provide sufficient power for operation of hand-held device 12 for days, weeks, months, or years. Batteries 32 may be used with other similar sources of portable power (not shown), such as solar cells. It will be appreciated the electronics of a PDA, cell phone, or other computer-like device capable of processing auxiliary data as described herein may contain significantly more electronics to provide functions to herein described that to relate to the other functions of hand-held device 12.

Three lights 20 are shown present on the circuit board, and they make take the form of LEDs. However, as will be understood from study of FIG. 14 the circuit may include provision for more than three such lights. For example, it may include circuits for energizing up to nine LEDs.

Referring now to FIG. 6, an embodiment of the hand-held device 12 devices is shown including the provision for an LCD 44. LCD 44 may be a textual display

consisting of 16 digits, but less or more display capability may be provided, based on need and usage. Alternate LCDs 44 capable of presenting the graphic content in monochrome or color, however, are preferably
5 used.

Hand-held device 12 has an power button 38 which when depressed will initiate operation of an LCD 44 to display a coupon, a prize notification, or other information indicating receipt by the device of auxiliary
10 data. For example, LCD 44 may used to display a first coupon in a circularly linked list of offers. Power button 38 may also held to initiate receiving video signals, or may be used for other display or control purposes separately from button 22. Scroll button 40
15 allows a user to traverse, i.e. scroll, information retained or received by hand-held device 12, for example, the circularly linked list of offers received and stored on the device 12. It will be appreciated that any of the various buttons 22, 38, 40, or 42 may be implemented by
20 using other buttons with other functions on hand-held device 12, such as the numbered buttons on the cell phone or shortcut buttons on the PDA. It will furthermore be appreciated that these buttons 22, 38, 40, or 42 may be implemented via touch screen, such that there is no
25 physical button 22, 38, 40, or 42 on the device.

The expiration button 42, at any time while viewing an offer, when pressed displays the expiration date of the coupon value and when released shows the original offer again, or alternatively switches between the
30 different displays. The expiration button 42 may display the date of hand-held device's 12 expiration, after which the device will no longer function or will have reduced functionality. The expiration button 42 may display the expiration of a program or function of the hand-held
35 device 12. The functions and programs of hand-held device 12 may be reused until expiration, and such reuse may include watching various games during a season,

watching all quarters or periods of play, and watching appropriate commercials.

As a further alternative, expiration button 42 when depressed or depressed in conjunction with other buttons 22, 38, or 40 may additionally display data information about where hand-held device 12 was issued to the user, where the user lives, a serial number, and other data that a sponsor may desire. The displayed data may also identify the holder of hand-held device 12 and may have a number, personal identification number, or other data personal to the holder, such as residential address. It may be desirable or necessary to disclose to the user the extent to which such personal information will be collected by use of hand-held device 12.

Accordingly, when hand-held device 12 is used at a redemption center, such as a point of sale, Internet website, or restaurant operated by or on behalf of sponsor 17, a benefit may be received by the user. Information about the user, based on data stored on the device, may then made available to the sponsor, merchant or other seller of product or service. In that way, the sponsor 17, merchant or other seller of product or service may learn about their customers, possibly adding the user's name or address or additional information about the customer to a customer base.

Offers received by hand-held device 12 may be indicated not just by illuminating the light signals 20, but by textual information and graphics displayed on LCD 44. Auxiliary data may contain offers which includes instructions or identification of the redemption location. The text may otherwise identify the product or discount or other coupon to be redeemed by the user. For example, hand-held device 12 may be used in a mode in which the device receives composite video signals which trigger preprogrammed offers that already exist in a linked list stored on the device 12.

After watching a commercial, auxiliary data causes

hand-held device's 12 preprogrammed textual information to indicate a product, discount, or other coupon available until an expiration date. Hand-held device 12, upon receipt of auxiliary data, retrieves the information and makes the offer available to the user.

Alternatively, the information may be received by hand-held device 12 during use and then decoded and displayed on LCD 44 as well as being added to the linked list.

Hand-held device 12 is useful to store multiple offers. Multiple offers may be from the same sponsor or different sponsors 17. The received offers may be valid for certain different amounts and for varying periods or dates. The hand-held device 12 may also be able to store previously received offers so as to indicate that a user will not be able to reuse them, as for example in the case of a prize or other one-time benefit.

Items displayed on LCD 44 are coupons which provide offers, coupon values, validation for discounts or other user benefits, such as prize merchandise identification or location for redemption. When hand-held device 44 is taken by the user to a redemption site, such as to the sponsor 17, merchant or other seller of product or service center, items stored on hand-held device 12 may be cleared by an authorized procedure at the redemption location, but alternatively the stored items or coupons may be reused until an expiration date. The coupons may contain the date the commercial originally ran, or the date the coupon was received by hand-held device 12. In other words, the auxiliary data may have an encoded date stamp, or the hand-held device 12 may date stamp the information received. The date information may inform merchants or sponsors of the least or most effective showings of their commercial.

It may also be desirable to purchase items from the use of hand-held device 12. Hand-held device 12 may store purchasing information, such as the numbers of one or more credit cards. This feature may be used, for

example, when hand-held device 12 is capable of receiving multiple offers. After such an offer is downloaded to hand-held device 12, the user connects the device to the Internet by any of the methods described herein. The user selects the offer, and selects to purchase the discounted item. The stored credit card and shipping information are transferred through the Internet to carry out the transaction. Hand-held device 12 may also store other data sufficient to make purchases, such as debit card or online wallet service information.

FIG. 7 shows circuit features of the card embodiment of hand-held device 12 without housing 14. LCD 44 is evident, as also controls 38, 40 and 42, and a pair of batteries 32 are located at the right side of the circuit board.

FIG. 8 shows a chart of an alternate embodiment of hand-held device 12 having an input-output means preferably in the form of a Personal Computer Memory Card International Association ("PCMCIA") interface, such as may commonly be found on a laptop computer. PCMCIA interface 70 connects with PCMCIA connector 72 to transmit information to and from a computer or computer-like device. Connections of PCMCIA interface 70 to a computer are preferably made by a PCMCIA port, but the connection means may alternatively be through other known computer and computer-like slots, connections, and ports such as Ethernet, Token Ring, infrared ("IR"), RF, Small Computer System Interface ("SCSI"), Universal Serial Bus ("USB"), parallel port ("Parallel"), serial port ("Serial"), IEEE 1394 FireWire ("FireWire"), S/PDIF, AES/EBU, fiber optical cable, and Apple Desktop Bus ("ADB"). Hand-held device 12 may also utilize portable data storage, such as flash memory, mini-disc, or stick memory, to manually transfer information from hand-held device 12 to a computer. The types of connections used in various applications of hand-held device 12 vary based on factors including cost, transfer speed, and acceptance

by users and industry.

Hand-held device 12 while preferably connected when applicable to a computer, may also be connected to computer-like devices or other devices capable of processing information transferred or executing functions from an computer-interface device. These devices include PDAs or other palm top PCs, cellular phones, and other hand-held net-connected or computer-like devices. The hand-held devices preferably have wireless Internet access, which allows for instant Internet transactions without utilizing a computer or computer-like device.

As with various other embodiments of hand-held device 12, composite video signals are preferably received by electrical means, shown herein shown as by an RF antenna 68. The power and functionality of the hand-held device are increased by additional RAM 51 connected to the microprocessor 50. The power system of the hand-held device, comprising battery 32, optional solar panel 33, and the power control 31 adequately provide the power needed for processing and interfacing with the various devices. Composite video signals may also be received by photocell 30, herein shown as a photodetector 30a and an optical receiver circuit 30b.

Preferably, the video signal is received electrically from display device 10, the auxiliary data is decoded, and transferred to hand-held device 12 by RF means. Alternatively, the video signal received by the device may be discriminated by the microprocessor 50 of hand-held device 12. As a further alternative, hand-held device 12 may receive the video signal by optical or electrical means, and transfer the received data through the PCMCIA interface 70. If the received data is processed on a computer, the computer may act as a discriminator, determining when auxiliary data is present and handling it appropriately. The data also may be sent back to hand-held device 12 for further processing, promotion, or information opportunities. When the

received data is not sent immediately through PCMCIA interface 70, the data is processed as in other embodiments described herein.

5 A preferable but optional visual response by LEDs 20 or LCD 44, promotional data may be available to the user's computer upon connection of PCMCIA interface 70 with the computer by the PCMCIA connector 72. Such promotional data includes Internet website or addresses, textual information and code, audio, and visual files.
10 Upon receiving the data either by RF antenna 68, optical detector 30, or by PCMCIA interface 70, hand-held device 12 may display an appropriate confirmatory message on LCD 44 or may otherwise notify the user of the reception of data.

15 An example of use of hand-held device 12 is as follows: A store or sponsor 17 issues a hand-held device 12 to a child, or otherwise providing the child with means to interact such as by providing a downloadable program from an Internet website to be used
20 on a cell phone, PDA, or smart card. During cartoons or at other times when children are likely to watch television, a television program is displayed which contains modulated video signals. The program advertises a product sold by stores or created by a sponsor. The
25 children are instructed to use their hand-held device 12 to tell their parents what toy they want for their birthday, holiday, or other special occasion. After capturing the auxiliary data containing information or product data, the children give hand-held device 12 to
30 their parents. The parents may then review the product selected by the child, and purchase the product or services directly if the device has Internet access. If hand-held device 12 does not have Internet access, the parents may connect the hand-held device 12 to their
35 computer with Internet access and purchase the toy or toys directly from sponsor 17, online from an Internet store, or from a store suggested by a representative of

5 sponsor 17. The toy will then be shipped to the location specified by the user, for which the information may be preprogrammed by the user. If hand-held device 12 has wireless Internet access and a stored credit card and shipping information, the parents may simply enter an approval code and purchase the product with little effort. Alternatively, the parents may bring hand-held device 12 into a store, or send it in to the store or sponsor 17, so that the order can be processed and fulfilled. Thus, parents may purchase the toys desired by their children with minimum time and effort. It will be apparent that hand-held device 12 could alternatively be used in a manner similar to a bridal registry, where the selected objects are not purchased, but are instead listed online on a gift registry. Thus, people who desire to purchase toys for the child will know what they child wants.

20 Another example of a use of hand-held device 12 is as a loyalty device which stores bonus points in the memory of device 12 and/or at a remote location such as a central computer. Hand-held device 12 stores bonus points for television shows or movies watched containing auxiliary data with bonus point values. Shows may require the user to obtain the auxiliary data at the beginning, during, at the end, multiple times during the show to receive the bonus points for watching the show. Users may receive additional bonus points by purchasing VHS or DVD movies, movie theater tickets, or merchandise.

30 Users may receive additional bonus points by visiting the sponsors' Internet websites, and even more for exploring their website and making online purchases. Users may receive even more points by responding to quizzes, questions, and surveys after television shows or movies. Users may interact by using hand-held device 12 to select their answer, and either upload their answer through the Internet, or verifying their answer upon review at a store. Users may earn additional bonus

points by trying out specific restaurants related to the sponsor or, if at an amusement park, for rides and shows sponsored by the sponsor. Thus, users have various opportunities to amass bonus points from many various
5 sources by a sponsor or groups of sponsors.

FIG. 9 is another embodiment of the hand-held device 12 with an input output interface in the form of a PCMCIA interface 70 and docking station 76 as shown. The docking station 76 may receive discriminated auxiliary
10 data or composite video signals and transfer it to hand-held device 12 by PCMCIA interface 70. Alternatively, docking station 76 may contain optics, which may be used to optically detect the video signal from a display device 10. Then either the entire video signal may be
15 transferred to hand-held device 12 so that device 12 can discriminate the auxiliary data, or the docking station 76 itself can discriminate the auxiliary data and transmit the auxiliary data to the device. The data may then be transmitted to hand-held device 12 by IR, RF, or
20 by PCMCIA interface 70.

Docking station 76 may charge the battery 22 by its battery charging control 80. Docking station 76 may implement various device functions and advanced device functions by controlling hand-held device's 76
25 microprocessor 50 through the interface drive 78.

The hand-held device 12 in FIG. 10A may be termed a camera card 12C, as it is similar to other devices 12 described herein, yet configured to simulate and suggest to the user the appearance of a small snapshot-type
30 camera.

Camera card 12C includes housing 14 in the shape of a small camera, and a lens or lens simulation 36 suggesting use of the camera-like hand-held device just as a user would use a snapshot camera, to take a
35 "picture" of the display device 10. Camera card 12C includes a simulated lens 46 either imprinted, embossed, molded, or otherwise extending slightly above the surface

of a camera-like housing 14 so as to present a more realistic simulation of a camera lens. The data-receiving photocell 30, when present, collects information in the same manner as previous embodiments using optical detection, and may be located behind simulated lens 46 or beneath a suitable aperture 36.

Button 22 when depressed and released simulates the shutter of a camera. Thus, it causes camera card 12C to receive either composite video signals or auxiliary data (depending upon the method as described above) until such collection is complete, thus the user simulates taking a snapshot or picture.

A viewfinder 49 is provided in the form of an aperture extending through housing 14, suggesting that a user aim at display device 10 through viewfinder 49 as they would on a real camera. Viewfinder 49 need not have any special accuracy or lenses, as its primary purpose is to simulate the look and feel of a camera. Camera card 12C will operate properly when its surface containing photosensor 30 is oriented toward display device 10, and its orientation need not be precise in the sense of a camera but only approximately directed toward the source of video signals. Photosensor 30 may be positioned behind lens simulation 46 or elsewhere for suitable sensitivity to video signals emanating from display device 10.

Other nonfunctional decorations (not shown) may be provided with camera card 12C to make further suggest to the user that they are taking a picture. Examples of such include a wrist strap attached to the camera, a camera case, an audio transducer in the circuitry of the camera card to make a clicking sound, or a flash.

FIG. 10b shows the reverse face or side of camera card 12C. It has controls and display features similar to those shown in FIG. 6. A difference is that enabling button 22 may be located along a top surface or edge of the camera. Camera card 12C is intended to allow users

to better conceptualize the process of receiving composite video signals from a display device 10. Use of camera card 12C may also provide other unique and fun opportunities such as pretending to take pictures and receiving such offers as previously stated.

FIG. 11A is the front of another version of the interactive hand-held device that may be termed a racing card 12R. On the front of racing card 12R is simulated lens 46, of a size smaller size than that of the camera card 12C, enabling more promotional information to appear on the front of card 12C. The promotional information may show or describe the racer or event(s) that the card can be used for or otherwise promote holder usage.

FIG. 11B shows the reverse face or side of racing card 12R. It has controls and display features similar to those shown in FIG. 6. A difference is that the enabling button 22 may be located along a top surface or edge of racing card 12R. Racing card 12R is configured to allow users to better conceptualize the process of optically receiving composite video signals from display device 10. The racing card 12R may also provide other unique and fun opportunities to the user such as receiving driving statistics and various offers and information as previously stated.

FIG. 11C shows the front side, i.e., user-opposite surface, of racing card 12R, with the user preparing to receive composite video signals by means of card 12R, and where the user is aiming card 12R toward display device 10, by sighting through viewfinder 49. The racing card 12R has control and display features like those illustrated in FIG. 11B or 11A.

As racing card 12R is used, auxiliary data may be received which may either update or replace that which is stored in memory of the card. Also, as scroll button 40 is depressed, more data than that displayed by LCD 44 may scroll across. For example, racing card 12R may have stored within its memory information about a race, a

racer, or other information relative to the event. It may include, for example, previous performances, standing of the racer, and biographical information. To provide a suggestion of the use of the racing card 44 and to
5 enhance its attractiveness for users, especially young users, a reproduction of a racing car steering wheel and instrument grouping may appear on the surface of the card, adjacent the LCD 44, as shown.

Turning to FIG. 13, a version of hand-held device 12
10 which may be termed a "sports" device 12S is shown. It includes housing 14 which is provided with front surface 16 which may include a visual field 54 for bearing the image of a sports contestant. In addition, a LCD 44 is provided together with button 22 which allows the user to
15 initiate operation of hand-held device 12, preferably with an RF antenna 68 oriented for receiving RF signals, or alternatively for optically receiving composite video signals, such as by holding hand-held device 12 so that leading edge 18 is generally towards display device 10
20 presenting a program relating to the sports celebrity or other person depicted on display device 10.

Update button 56 is pressed when user desires to obtain some current information, such as the current statistics of the player depicted on sports device 12S.
25 In operation, sports device 12S may be designed to receive only information relating to the player depicted on the device 12S, update that player's statistics, or add to information about the player already stored in memory of the device, any of which may then be scrolled
30 across LCD 44 by pressing scroll button 40.

Use of sports device 12S is as follows: display device 10 near the user presents a professional sporting event, such as a baseball game. When the sporting event's participant becomes the focus of attention, such
35 as a professional baseball player coming to bat, button 22 may be actuated. An aiming light 24, if present, may illuminate, or instead LCD 44 may initiate a readout of

its newly received statistics associated with the depicted player. For example, the readout may identify his name, his batting average, the number of home runs hit, games played, number of times at bat, and his runs
5 batted-in average and number of stolen bases, with the statistics updated each time such a player is at bat. The statistics may be sent to a computer through an interface (as described above).

A memory of sports device 12S may include such
10 statistics in a non-volatile from which the device 12S is enabled to update the statistics each time the player comes to bat. Auxiliary data associated with an at-bat occurrence received by the sports device may contain information associated with the player, such as his
15 current statistics. As play continues, received auxiliary data may include updates for those statistics based upon the experience of the player at bat. The information is stored in a circularly linked list of data and may include various statistics from different games
20 that the player has played in, various statistics over multiple years for this player; or if this device 12S is for use in watching an entire team, for instance when sponsored by the owner of the team, it may contain different information on various members of the team.

25 For example, as a celebrity batter is taking his turn during a baseball game, the television viewer directs his sports device 12S at display device 10 to receive composite video signals, or preferably configures his device so he may electrically receive the auxiliary
30 data. In both cases, the viewer receives real time statistics about his favorite athlete during the telecast via his interactive sports device. Additionally, the user of a sports device 12S at a live sporting event may receive information without the use of a display device
35 10, such as by RF or IR. Thus, sports fans may get live statistics and trivia through their hand-held device 12 while they watch the game live. Therefore, fans with

obstructed views or sports fanatics may obtain additional information and have fun while enjoying a live sporting event. The information received by the sports device 12S may take many forms including, as noted, statistics such
5 as batting average, home runs, or other personalized information about the player that is stored in the device for future reference or updating. An example of such presentation is shown in FIG. 13B. The stored information may then conveniently displayed on the LCD 44
10 for the device holder by the push of scroll button 40 or update button 56, or otherwise transferred through a PCMCIA interface 70 to a computer.

Because sports device 12S enables users and owners to trade the devices 12S among themselves, devices 12S
15 takes on a special value and enhances its worth as it is used. As the sports device 12S acquires data and is updated by use during televised play, the device 12S becomes increasingly more valuable and attractive to acquire. The sports device 12S may be of a design
20 resembling a baseball card and may be traded for other devices 12S. In addition, the sports device 12S may be equipped to retain a permanent serial number or edition number, or other information giving the hand-held device unique identity or value and thereby becoming a valuable
25 collectible. Optionally, the sports device 12S may be connected via an interface such as IR or RF to transfer stored information to another device capable of receiving those results. The sports device 12S may therefore be used in rotisserie opportunities.

30 In addition, the sports device 12S may provide capability for certain permanent characteristic information, such as the batter's name, team, previous teams, and other characteristics, personal data, and additional data that may become permanent based on
35 received statistics and information. Such characteristic information may be called to LCD 44 or otherwise transferred to, received by, and displayed on a computer.

Sports device 12S may be used for coupon indicating and redemption purposes. During play, other information such as a trivia game or quiz may be received by the sports device where the answer will be revealed later, such as during the course of the game, at the end of the game, during half-time, or at any other appropriate time during play. A game may be part of a promotion wherein a user selects the answer and purges the remainder of the stored data, then takes the device to a benefit store or other redemption site during the course of the next week, and has the possibility of receiving some kind of discount or prize based upon the answer selected. Such a game could be part of a "guess today's attendance" at a professional baseball game during seventh inning stretch.

Use of sports device 12S in connection with a baseball game is merely illustrative. Other sports in which players have statistics which change during play, over a year, or which may include information unique to the player, such as hometown or previous teams, may similarly be downloaded or conveyed by the device. Sports device 12S may also be used in connection with concerts and other special presentations, when televised or appropriately presented. Users are able to acquire useful information about the concert or special presentation, such as the names of performers, set lists, the venue location and history, and related Internet addresses. Persons with hearing impairments may receive real time text of live speeches on their hand-held device auxiliary data transmitted by RF is received on the device. Thus, an alternate version of the sports device 12S may be used to receive information relating to monuments, buildings, cars, animals, etc. during the course of a live or video presentation, wherein the transmission to the device may be received and contains auxiliary data.

An alternate version of the sports is a hand-held device that may be termed a "gaming" device. The gaming

device, similarly to the sports device, encourages users to interact with video broadcasts of sport events.

However, in this embodiment, users viewing a televised live sporting event utilize their gaming device to

5 predict future actions by a selected player or team to amass points in competition with other users.

For example, two baseball teams compete in a game featuring live modulation of auxiliary data. A sponsor or various sponsors distribute gaming devices to various participants prior to the start of the game. Users
10 predict each pitch to be thrown for selected batters, pitchers, or teams, using a number code or viewing and selecting from the touch screen display for each pitch. Alternatively or additionally, pitching results (i.e.,
15 balls or strikes), hitting results (i.e., strikeouts, walks, hits, home runs, etc.), runs per inning, or other calculable statistics may be selected prior to occurrence. Correctly guessing the occurrence earns points, which accumulate in the memory of the device.
20 Following the game, the device users may submit their hand-held devices either at a collection location or through an Internet connection and submit or upload their scores. The user with the highest point total wins a large prize or discount, with various consultation prizes
25 alternatively available. The predictions may take place for one particular batter, in one particular inning, or for one particular team. Gaming devices may also be used in a similar manner to predict and play other events such as basketball, hockey, and football.

30 Another example of use of the device is as follows:

The user watches a trivia game show, such as the television show "Who Wants to a Millionaire?" The user may able to play long, by utilizing their hand-held device. The question is downloaded and received by the
35 hand-held device, either during the broadcast or prior to the broadcast, by the methods described herein. The questions are synched to the display device, thus when

the display device first presents the questions, the encoded data will trigger the hand-held device to display the question and possible answers. The user chooses the correct answer, or places the answer in order in a timely manner, or must otherwise comply with the rules of trivia game request in a similar manner of the contestants. The user may then receive points or credit for the correct or timely answer based on factors, which may include number of other at home users who answer correctly, or speed of answer. The percentage of at home viewers either nationwide, local, or by other area may be displayed in real or delayed time either on the display device, Internet website, or on the hand-held device. Thus, users may achieve regional or national rankings based on their performance. The final results from the various games may be stored at a central database. Users who score high may receive recognition, a prize, or an option to play a future game.

Another example of use of the hand-held device is as follows: The user takes their hand-held device and appropriately configures it to receive modulated video from a display device. Upon watching an event, such as the "Grammys", performers appear on the screen and perform their song. The user is notified that an interactive opportunity is available, either through their display device or their hand-held device. This may occur as the modulated video triggers a graphic rendering unit in a decoder box, thus creating an icon appearing on display device. (Therefore not appearing on the display device of people who do not have such a unit.) The hand-held device provides the user with an opportunity to purchase the song or the album on which it appears. The money for the purchase can be through online automation or a third-party Internet website, or may be entered or taken from the website. Or, if the user so desires, an order requiring final approval and payment information can be sent to the user's selected e-

mail address. The user can purchase the music in the following manners directly, through a third party's website such as the affiliate program at "CDNow", or may come directly from the manufacturer. Otherwise, a link
5 for the special purchase can be sent to the user's regular e-mail address. Bonus or additional rewards may be sent such as a bonus disc with previously unreleased material, live songs or videos, or might include a product discount. Alternatively, the user may have the
10 song sent in appropriate digital format to their e-mail account or the selected song could become available for a period of time at a website for the user to download. Finally, the song could become part of a list that when full to the length of a CD is automatically created and
15 sent to the user. It will be appreciate that this method of purchasing can be used with any manner of products sold (such as jewelry on the "QVC network"), or in other fields (such as movies).

The hotel card 12H is yet another embodiment of the
20 card with the functions of a sophisticated hotel room key. The hotel card works with a smart card reader lock system, allowing guests of a hotel to enter and exit rooms, such as a guest's hotel room, garage, or pool area. The hotel card can allow similar access by an
25 optional magnetic strip located on the exterior of the enclosure.

Upon hotel check-in, guests are given a hotel card to use throughout their stay. Hotels and hotel chains may alternatively issue permanent hotel cards to frequent
30 guests and initiate hotels stay with room access on the user's card at check-in. A child's version of the hotel card can be provided upon check-in, to allow children restricted access to hotel facilities and special promotional benefits available only to children.

35 Once a guest receives the hotel card, the card can be used to enter the guest's room and other hotel facilities. The guest user can also use the hotel card

as a charge card, charging products and services internally, such as dinners at the hotel's internal restaurant, gifts at a gift shop, or snacks from a vending machine. The incurred charges will be recorded
5 on the hotel card, appearing on the user's bill at check out.

Coupons, benefits, or information can be loaded onto the hotel card at check-in and at other desirable times and places, such as the beginning of the each day at the
10 hotel's front desk. Using a smart card writer, the hotel cards can be loaded with opportunities for use or redemption over a limited amount of time. These opportunities or coupons may be discounts for local attractions, cash equivalents such as gift certificates
15 for use at particular local attractions such as a restaurants, information on special pricing, or additional access privileges. The card may also load the guest's hotel preferences, including room type and preferred activities.

20 The hotel rooms may optionally provide reader/writers in the hotel card user's room. Data is written to the smart card as a result of the electronic decoding performed by the docking station. The docking station can also read the data from the card, and
25 transmit the information to a central computer preferably by a network line or otherwise by a telephone line. Alternatively, the reader/writer can be in the form of a remote control, acting as a cradle when the card is properly inserted. IR sends data back and forth to and
30 from a networked docking station and remote control.

The reader/writer reads stored data off of the hotel cards, and displays relevant information on the television in the guest's room. Such information may include the total from the purchases using the card,
35 combined with room costs to generate the hotel bill to date. The guest can also purchase items through use of the hotel card and an appropriately connected docking

station for items such as tickets to a local attraction or additional hotel services. An alternative means of reading and writing to the card is through use of a computer and computer interface on the card, as described
5 above.

Guests can obtain additional coupons by viewing television programs modulated with auxiliary data. Such data may be optically received directly to the card, electronically received by the docking station, or
10 received through a computer interface. The information received by the card typically relates to special discounts as well as information about area attractions.

Television stations or the hotel itself can modulated the television signals to limit the viewers capable of
15 receiving the signal. Thus, only visitors having the specialized hotel cards can receive the special discount.

The hotel cards can be used as credit cards, and optionally contain a charge limit along with information
20 as to where the card can be used to buy items and then charge them to the hotel room. Thus, businesses outside of the hotel can enact purchase transactions on the hotel card, which are added to the users bill. The charge limit many optionally varies based on guest stay
25 frequency, charge history, or credit history.

The hotel or other sponsor may allow the user to collect bonus points by use of the hotel card. Permanent hotel cards store a running total of bonus points, with optional frequent back ups of the point total to a
30 central computer through properly connected reader/writers. Alternatively, upon each stay the hotel card can be loaded with bonus points earned from previous visits and stored on a central computer. Bonus points can be awarded per stay and per night, or based on other
35 purchases made with the hotel card. Additional bonus points may be earned by visiting local attractions. Bonus points may be redeemed for a gift, discounts, free

meals, room upgrades, a free night's stay, or converted to airline frequent flyer miles.

Agreements with local attractions provide additional means for user advertising. Indicia of various
5 agreements and sponsorships may be visible on the card's enclosure. Various offers and information on attractions may be encoded on the hotel card. All purchase transactions are logged, and the appropriate charges occur when the guests checks out. The hotel can charge a
10 flat fee or percentage for these promotional activities.

Guests have incentives to use their hotel card and visit attractions encouraged by the card. Guests eat at a suggested local restaurant, receiving a discount on the
15 meal, paying by the use of the hotel card, and receiving bonus points. For example, a local restaurant may have a buy one get one free coupon loaded on to the card ,so the guest is more likely to go to that restaurant than a competitor without a coupon. The guest can then visit a
20 major attraction and get bonus points for various suggested activities that they do or items that they buy, for which the purchases can be made through the hotel card. Attractions that wish to honor hotel card promotions should have a reader/writer and a dial-up or
25 network connection to the central computer if a purchase is possible at the attraction. However, accumulating bonus points can be performed by simple write transactions on the card, so that the points are stored on the card and are not immediately transferred to the
30 hotel's computer.

At checkout time, the guest's account is cleared out and paid. Guests, if desired, can have an "express check out" such that they do not need to sign a bill, but simply swipe their hotel card across a reader with a
35 connection to the billing center. The hotel card is either returned to the hotel for resetting for future clientele, is disposable, or is made inoperable until the

guest's future check-in. Before clearing the card, bonus points and information regarding purchases and uses may be stored in the hotel's computer. On the next stay, the user's bonus points will again be accessible.

- 5 Alternatively, a third party or clearinghouse may set up the coupons and distribute the cards. The hotel would then get a percentage of the overall value of the transactions or a sales commission.

10

- Interactive hand-held devices specially configured for conventioners (or conference attendees) may be termed a "convention" device. Convention devices permit conventioners to capture information about various
15 demonstrators and companies by viewing various booths or video presentations and capturing information or opportunities to the device. Information is captured from the reception of auxiliary data, as is described herein. If the demonstrators so desire, the
20 conventioners may receive coupons on their convention device for discounts or free gifts from visiting the demonstrators' booths. The coupons are redeemed by visiting the demonstrator's store or Internet website.

- Another valuable manner in which the devices may be
25 used is to receive auxiliary data at a convention, show, or other any other type of special event, and then offering users opportunities to receive useful information at the special event. For example, a user may watch a video presentation in a convenient location,
30 such as a hotel room, about an upcoming convention. The presentation may show booths, locations or special offers at the convention. As the user sees one of these booths, locations or special offers, the user selectively uses the hand-held device, by pressing its operating button 22
35 or equivalently initiating control, to cause the device to receive auxiliary data (as described above) which identify these booths, locations or special offers.

Then, the user may visit the convention premises, operating the scroll button of the hand-held device to display the booths, locations, map of the premises, or special offers conveniently and helpfully as the user
5 goes about the convention.

The convention devices may be presented to the conventioners with their name and address preloaded, so that the devices may be conveniently read at each convention booth. The convention devices may also
10 provide conventioner information to the sponsor when used at their store or Internet website.

Before or during the convention, conventioners may watch television in their hotels rooms or in a common area to learn about the companies that will be presenting
15 or have booths at the convention. The conventioners may selectively receive information or coupons from the demonstrators by optical or electrical methods. Users may receive information such as booth numbers and locations, and as well as opportunities for discounts
20 that may be used during the convention.

Another embodiment of the convention device may be referred to as the "museum" device 12M. Museum device 12M allows visitors to track areas or exhibits at a museum. Embodiments of the device may have LEDs 20, to
25 signify receipt of auxiliary data from any of the sources described above. Such a museum device 12M may be used by a schoolteacher to verify that students have visited specific exhibits at a museum or museums that have video demonstrations or otherwise send data through RF.

30 The museum device's 12M LCD 44 may further direct the device's user. The user is provided with instructions on the location of the next exhibit, time left in the museum before closing or before user's groups departing, redeemable coupons for the museum's gift shop,
35 or other information relevant to the exhibit or museum.

Museum device 12M is usable at a series of locations, such that users obtain indicia or information

from each location. Museum device 12M may be used in activities such as "scavenger hunt", where users must obtain the proper information or indicia from each location to win or complete a game or activity.

5 In FIG. 14 a schematic circuit diagram of one form of circuitry that may be used to provide the features and functions of the several embodiments described herein, elements are identified by their conventional numerology conventional characters proximate of the elements.

10 Optional photosensor 30 is seen to be constituted by a photodiode or phototransistor Q2 which provides the signal to amplification and filter circuit consisting of an operational amplifier U1A including a circuit consisting of the components of C1, R19, R18 and C12

15 interconnected between the output and the inverting input of operational amplifier U1A, and so providing an amplifier and filter. Thus amplifier and filter signal is provided through R15 to a filter and frequency shaping circuit comprising of an operation amplifier U1B having

20 in its feedback circuit the components C10, C11 and R16. These circuits provide a filtered, frequency-shaped output through a resistor R5 through a circuit consisting of operational amplifier U1C and resistor R11. Operational amplifier U1C has an output coupled to a

25 diode pair D11 which thus provides a pair of outputs, the upper to a circuit comprising an operational amplifier U1D, providing in effect a buffer whose output is a data signal delivered through a resistor R20, and the lower of the diodes D11 providing a signal through a resistor R1

30 to a further resistor R7, across which is a capacitor C3. The node between resistors R1 and R7 provides 16kHz signal that is of the horizontal line scan rate or frequency television display optical signals received by photosensor 30 (Q2). The horizontal scan frequency of

35 conventional NTSC color signals is, more precisely, 15.625kHz. (approximately 16kHz, as here described). Similarly, the discriminator circuitry provides at the

output of operational amplifier U1D an 8kHz signal representative of the auxiliary data received, as produced by alternate-line luminance modulation of the display. The discriminator circuit thus described provides both the 16kHz and 8kHz (more precisely, 7.8175kHz), which constitutes the actual data, and determines whether the 8kHz data carrying the information (data) content of the received auxiliary data is present by determining whether average signal magnitude of the 16kHz or 8kHz signals is greater, so that if auxiliary data is present, i.e., there is 8kHz modulation energy in the received light signals, they are provided to a microprocessor of the U2 of the circuit for decoding the information content within the 8kHz signal. Thus, the received composite video signal is amplified and filtered to de-emphasize the 16kHz signal and retrieve the 8kHz signal carrying the data. I.e., wave shaping and frequency shaping filter circuits provided by operational amplifiers U1A & U1B de-emphasize the horizontal retrace frequency and amplify the half-frame rate carrying the data content of interest. The circuits filter the frame rate signal and use it as a reference to compare its relative signal magnitude against the 8 kHz data-carrying signal. If the retrieved 8 kHz signal is of greater magnitude than the conditioned 16 kHz signal, auxiliary data is present and may be utilized by the processor. Microprocessor U2 is preferably of commercially available type Z86E02, and operates according to machine instructions stored in its resident ROM memory. Flowcharts of the functions performed by the machine instructions are set forth in the appendix. Although not separately shown microprocessor U8 includes random-access memory (RAM or DRAM) in which decoded data is stored. Thus, microprocessor U2 is to decode and store, or store indication of, the data present in the 8kHz signal, as by illuminating one of more of the LEDs and causing them to remain on as evidence or indication of the data,

substantially in accordance with the teachings of Broughton, and to drive displays of the device and/or its LEDs or other signal devices, as well as to provide any audio function, as well as also to energize an aiming
5 LED7 when auxiliary data is present. So also, if desired, a signal may be driven by U1 in response to the presence of the auxiliary data, thus providing an aiming light function indicating, in simple effect, that the hand-held device is receiving composite video signals.

10

For providing illumination of lights 20 or 20a-20d described above in connection with the various embodiments, shown here are nine LEDs D9-D18. It will be understood that not all of these LEDs need be used for a
15 specific embodiment of hand-held device 12. That is, the circuit may be configured so as to drive one, two or three or more of the LEDs as according to the desired function and use of the device.

Shown adjacent microprocessor U2 are two diodes D15
20 and D20 which are used to bypass any noise generated from the microprocessor. The speaker SPK1 is element 34 shown in FIG. 5. A clock crystal XTAL1 provides 8MHz clock signal to microprocessor U2. Capacitors C8 and C9 are part of the clock circuit.

25 Immediately adjacent the clock circuit is a switch S1 to provide the function of button 22 in the several embodiments for initiating operation of the device. Switch S1 is tied to a power supply circuit comprising power cells a resistor 14, V2 and V3 (each of 1.5v
30 potential), and a resistor 14, and including a switched analog power circuit comprising a transistor Q1 and resistors 12 and 13 which enable power to be provided to the array of LEDs D8-D18.

Referring to FIG. 14 there is FIG. 15 another
35 version of circuitry invention is shown which may be used to provide still other embodiments of the hand-held devices of the invention. It includes a microprocessor

U2 which may of commercially available type Z86X08. It is similarly provided with 8kHz and 16kHz signals (more precisely 15.635kHz and 7.8175kHz) which respectively constitute the horizontal retrace signal and the data signal at half of that frequency, since the auxiliary data encoded on alternate horizontal lines and so is effectively present at only half the horizontal scan rate, as explained above. These signals are identified as VEILA and VEIL REF that are provided as inputs to microprocessor U2. Therefore, it will be understood that operational amplifier circuits consisting of operational amplifiers U1A, U1B, U1C and U1D provide the same functions of amplification, filtration, frequency shaping and discrimination, as well as buffer circuits described in FIG. 14. The microprocessor, clocked by crystal X1 at 8MHz, decodes the data provided by the composite video signal, stores it in internal RAM or DRAM and drives an LCD 44 illustrated as circuit component LCD1 which may be, as shown, a 16-character by 2-line display. It may instead be a 12-character by 3-line display, for example, or other format appropriate for the display message to be presented at the surface of the device.

Power for the circuit is provided by two cells BT1 and BT2 of 3 volt potential to a circuit including Q2 to provide not only main power by auxiliary power, the later being delivered to the microprocessor for maintaining its continued operation, such as for date and time keeping even when the display is not being operated and collectively referred to as battery 22. A switch S1 is provided for performing the function of power button 38 (as shown in FIG. 6) in the several embodiments and, when pressed, enables power to be provided to the LCD1 and other switching functions may be provided by switches S2, which controls scrolling of the LCD 44, and switch S2 may be actuated by scroll button 40 shown in FIG. 10B. Similarly a switch S3 provides a date function that may be actuated by expiration button 42 shown in FIG. 10B.

These signals control inputs to operational amplifiers U3A and U3D, respectively, and these are provided as inputs to the operational amplifier and also to LCD1. The clear switch will, when operated as described above
5 clause clearing of the date, and the scroll switch enables the user to cause the message across the LCD 44 as that in FIG. 6. Operational amplifiers U3C and U3B provide voltages useful according to the connection illustrated.

10 The circuit embodiments shown are used in conjunction with a method for producing a composite video signal containing video program material and control data, and displaying the signal on a television and decoding such control data for ancillary use, wherein the
15 method includes modulating at least one video field within the viewing area of a television in such manner that the modulation is substantially invisible to the television viewer, thereby producing a video subcarrier component of the signal (which is as indicated detectable
20 at an 8kHz rate) containing the data; and detecting the component to reproduce the data for the ancillary use. Although luminance modulation is particularly useful for that purpose when using hand-held devices in accordance with the invention, chrominance modulation may instead be
25 employed as according to Broughton. Furthermore, the improvements in modulation described in Ciardullo may likewise be used. Various alternative modulation (and corresponding modulation) schemes may be employed as alternatives, including (but not limited to) amplitude
30 shift keying (ASK), frequency shift keying (FSK) modified frequency shift keying (MFSK), and phase shift keying (PSK). And although the substantially 8kHz data-carrying submodulation is at half the NTSC horizontal scan rate, other submodulation techniques may be used at other
35 multiples or submultiples or other periodic rates which are other functions of the horizontal scan (retrace) rate.

FIG. 16 is a block diagram of circuitry of yet another possible embodiment of the interactive hand-held devices, designated 12F, which shows discriminator and microprocessor circuits 50 which are in accordance with
5 FIGS. 14 or 15, and receiving composite video signals by photosensor 30 so as to decode the auxiliary data and provide either light signals as described above, or, preferably, to drive LCD 44 according to the foregoing description. Thus, it includes an update or initiating
10 button 22, as according to the sports device 12S. In addition, an FM receiver 62 and associated antenna 64 may be provided as a surface-mount module added to the printed circuit board of the device. FM receiver 62 and associated antenna 64 may be of commercially available
15 design, suitable for being powered by battery 22 or cells (not shown) provided in accordance with the foregoing description of various embodiments. Control button 66 may optionally initiate operation of FM receiver 52 so that it sends FM-demodulated signals to the discriminator
20 and microprocessor circuits 60 that may be configured to respond accordingly either to photosensor 30 or to FM receiver 62 according to whether update button 56 is pressed. The FM receiver 62 alternatively be any type of RF antenna that is of the size and accordance with the
25 invention, such that the discrimination may take place on a decoder; and the results are sent to the hand-held device 12 via RF.

Hand-held device 12F may be sports device operating otherwise according to version 12S described in relation
30 to FIG. 13, but the addition of FM receiver 62 gives the new device the capability of being used in sports stadiums and other performance venues where video signals are not available. Thus, the device 12 may receive either optical signals or electrical signals. In the
35 case of a sports device according to FIG. 13, the user may as described above receive statistics about a player depicted on the device, or about a player at bat.

According to a preferred method of using device 12F, the same auxiliary information as would be transmitted via a television broadcast for being received on a display device 10, there to be displayed as composite video signals, is in addition transmitted by low-power FM signals in the FM broadcast band of 88-108 MHz. For this purpose, FM receiver 62 may be pretuned to an appropriate frequency for such low-power signals. The FM signals may include batter statistics, for example, as batters come to bat, so that holders of the new devices 12F may update their devices as their preferred batters come to bat.

Hand-held devices 12 may have use in various sports events, entertainment presentation, conventions, museums, tours, and guided events at which holders of devices might not conveniently use them while in the presence of a television display carrying auxiliary data, but where the location in which the devices will be used will permit low-power FM or other RF signals. Other commercially significant usage of the devices of FIG. 14 can be made, similar to the methods of using the previously described versions. Similarly, devices of the invention may be adapted to receive AM signals, or auxiliary light signals such as IR (infrared) light signals, different from the composite video signals.

Similarly, hand-held devices 12 of the invention, whether or not sized as "cards", PDAs, or cell phones or other conveniently hand-held size, and whether in the form of racing devices, may simulate other objects, vehicles, personalities, or devices for house-hold, personal or business use, so as to provide a verisimilitude or facsimile representation of such devices or usage, so that the hand-held device suggests to the user the manner of its use, or conveys to the users special feeling, sense, identity or association with a field, activity, sport, entertainment or other use of the device it represents. In games, for example, in which some or all of the information content useful in

the game may be provided by auxiliary data, hand-held devices of the invention configured to provide a verisimilitude or facsimile representation of such devices or usage may give players of the game enhanced
5 sense of play, participation or gaming identity. The foregoing are merely illustrative of the many possibilities.

When used in a system for deriving benefit from encoded data including means for producing video signals
10 modulated with auxiliary data, such as by providing commercially sponsored television programming including auxiliary data, new hand-held devices of the invention have special impact for television response, advertising and promotions, as the new system and devices are useful
15 in providing, among others, the following commercially advantageous results when they are distributed to viewers and used by viewers to receive auxiliary data transmitted with normal programming content, which may include advertising, promotions and other sponsored transmission.

20

A method for card redemption is described in the context of an optically loaded card, however, such a method could also be employed with other cards that have coupon redemption requirements. The components of an
25 electronic couponing card which support the method for card and value redemption include:

- 1.) LCD or other human readable method to display data.
- 2.) On board computation to sequence the logic
30 defined below.
- 3.) A method to load "electronic coupon" information onto a card.
- 4.) Buttons or other method (such as a touch
screen) to sequence through the coupons loaded on
35 the card.
- 5.) Button or other method (such as a touch screen) to put the card in "redeem" mode.

6.) Laser detection hardware described below.

Presently, most POS systems use a computerized cash register tied to inventory management software and bar code scanning hardware. One embodiment of a method of using an electronic coupon card and existing hardware and software located at a POS for electronic coupon redemption is described in the following steps:

- 1.) Coupon data is encoded onto a video signal, e.g. television signal. The encoded data would also contain additional text describing the coupon along with a numeric code to be entered at the POS.
- 2.) The user points the multi-use card at the television screen when the television signal containing the coupon data is airing. The electronic coupon data is then captured by the card by optically receiving the data that is presented on the display. The coupon data could also be captured with methods other than optical detection, including but not limited to radio frequency (RF) or hard-wired electronic data transfer.
- 3.) After capturing the electronic coupon data, the user can then view coupon information such as requirements, valid dates, valid POS locations, etc. on the LCD of the card. (Other numeric codes described in the following steps that are used for identification and security purposes are not available for viewing by the user at this time).
- 4.) When the user desires to redeem the electronic coupon, the card is transported to a POS and the user buys the desired item or otherwise follows the requirements of the coupon offer.
- 5.) At the check out, the cashier takes the card and locates the correct coupon using the scrolling function (usually a button) of the card, in concert with viewing the data on the LCD screen.

- 6.) The cashier then presses the required "redeem" button on the card. The cashier then has approximately one minute to complete steps 7 and 8 below. Requiring this button to be pressed reduces the likelihood that a coupon will be accidentally redeemed through bright ambient light.
- 7.) When the correct coupon is located, the card is held with the LCD screen facing the cashier and the back of the card facing the bar code scanner located near the cashier. The bar code scanner is the same scanner that is used for purchases and conventional paper coupon redemption.
- 8.) When the scanning laser light is detected by the card, the card beeps and the numeric code described in step #1 is displayed on the LCD screen. In addition, another code that represents the serial number of the card is also displayed. The second number displayed could also be a special code generated as a combination of the downloaded numeric value (step #1) and a hidden internal (to the card) serial number. The second number can be generated by various standard encryption methods and could be used to increase the security of the transaction because it would uniquely identify the card and transaction but would not be easily duplicated.
- 9.) The cashier then has 30 seconds to enter either the numeric code only or both the numeric code and card serial number (for greater security). After 30 seconds, the card automatically erases the coupon. The coupon may also be erased quickly by a press of the "redeem" or "scroll" keys during the 30 second period. (The scroll key is used to allow multiple coupons to be located and redeemed efficiently as described below).
- 10.) If additional coupons are to be redeemed at the same time, the above steps are completed for the

first coupon. Additional coupons are redeemed with the cashier repeating steps 5 through 9 above.

In an alternative embodiment, steps 8, 9, and 10 are replaced with the following steps:

8'.) When the scanning laser light is detected by the card, the card beeps and displays a numeric code, or alternatively an alphanumeric message, on the LCD screen. In addition, another code that represents the serial number of the card is also displayed. The second number displayed could also be a special code generated as a combination of the downloaded numeric value (step #1) and a hidden internal (to the card) serial number. The second number can be generated by various standard encryption methods and could be used to increase the security of the transaction because it would uniquely identify the card and transaction but would not be easily duplicated.

9'.) The cashier, upon viewing the number code or alphanumeric message, can determine whether or not the triggered card is the card that was pre-selected to win a prize or to receive a special value or discount. If the card alerts the cashier that a prize has been won, the cashier may optionally enter the second number (step #8b) into a database to verify that the card has not been tampered or altered. The prize may also be erased quickly by a press of the "redeem" or "scroll" keys during the 30 second period. (The scroll key is used to allow multiple prizes to be located and redeemed efficiently as described below).

The following describes how detection of a laser scan across the card can be accomplished: Almost all bar code scanning devices use a red laser of either the helium neon (HeNe) or diode types. The scanners deliver an extremely bright light in the 832.8 nanometer (nm)

wavelength for the HeNe or 640nm wavelength for the diode lasers. The wavelength spread for a laser is extremely small, which allows for narrow optical filters so that non-laser ambient light can be filtered out. A simple
5 electronic/optical circuit is shown in Fig. 17 and can be used to detect the signal.

As shown in Fig. 17, electronic/optical circuit 100 includes optical filters 120a and 120b, load resistor 140, microprocessor trigger 160, and phototransistor 180.

10 Optical filters 120a and 120b are used to prevent the electronics of the card from being triggered by ambient light, e.g. bright sunlight. Optical filter 120a is a neutral density type to reduce the intensity of light and optical filter 120b is a red bandpass type.

15 A photodetector is required to detect the laser light. This detector can be phototransistor 180 since only an ON/OFF signal is required. Phototransistor 180 has a small resistive load on it, as represented by load resistor 140 so that phototransistor 180 is less
20 sensitive to light. Load resistor 140 therefore reduces unwanted triggering.

The output of electronic/optical circuit 100 is fed into a microprocessor on the card where the output then becomes the trigger that causes the beep, etc. as
25 described in the above steps.

In view of the foregoing description of the present invention and practical embodiments it will be seen that the several objects of the invention are achieved and other advantages are attained. The embodiments and
30 examples were chosen and described in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the
35 particular use contemplated.

As various modifications could be made in the constructions and methods herein described and

illustrated without departing from the scope of the invention, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative rather than
5 limiting.

The breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with claims of the application and their
10 equivalents.

The present system and hand-held devices useful in the system may be for these purposes distributed by various business entities, which may include not only the sponsor of a program, event, or other sponsored
15 transmission, but may also include various businesses, services and organizations having commercial relationships with the sponsor. Viewer's use of the new devices of the invention accordingly provide commercially advantageous results relating to television advertising, promotions and other sponsored transmissions, wherein new
20 system and devices and their use is effective to:

- Attract viewer attention to advertising, promotions and other sponsored transmissions
- Effectively increase awareness and retention of message
25 and product
- Induce viewers to respond and take action after viewing to sponsored transmissions
- Differentiate a sponsor's product or service from those of competitors.
- 30 • Stimulate viewers to desire to watch advertising, promotions and transmissions.
- Provide a novel, cost-effective, brand efficient, and enjoyable medium for enhancing advertising, promotions and other transmissions
- 35 • Cause advertising, promotions and transmissions to take on special event significance

- Build customer traffic in places of business or points of sale associated with sponsors of advertising, promotions and other transmissions
- Increase consumer loyalty to sponsors of advertising, promotions and transmissions
- Increase viewer involvement in sponsored advertising, promotions and transmissions
- Cause viewer retention of sponsor identity and advertising or promotional content
- Enhance sales volume resulting from the sponsorship of advertising, promotions and transmissions
- Provide lasting value to sponsored advertising, promotions and transmissions
- Provide enhanced viewer/spectator involvement in sporting and racing events
- Afford viewers of television programming an opportunity to interact meaningfully with programming content and with advertising, promotions and transmissions.
- Enhance viewer good-will relative to advertising, promotions and events.
- Cause development of still other opportunities for interactive use of the devices.

* * * * *

In view of the foregoing description of the present invention and practical embodiments it will be seen that the several objects of the invention are achieved and other advantages are attained. The embodiments and examples were chosen and described in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated.

As various modifications could be made in the constructions and methods herein described and

illustrated without departing from the scope of the invention, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative rather than
5 limiting.

The breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their
10 equivalents.

What is claimed is:

1. A system for deriving benefits from auxiliary data in
5 video signals by use of a hand-held device responsive to
auxiliary data, said system carrying out the steps of:

modulating video signals to carry the auxiliary data;

- 10 providing the user with means of responding to the
auxiliary data received on the hand-held device;

determining that the video signals contain the auxiliary
data;

- 15 providing a benefit from the receipt of the auxiliary
data.

2. A system as set forth in claim 1, wherein the method
20 of determining that the video signals contains auxiliary
data is by:

receiving the video signals on a decoding box;

- 25 causing the decoding box to electronically determine
whether the video signals contain the auxiliary data; and

transferring the auxiliary data from the decoding box to
the hand-held device.

30

3. A system as set forth in claim 1, wherein the method
of determining that the video signals contain auxiliary
data is by:

- 35 receiving the video signals on the hand-held device; and

causing the hand-held device to electronically determine

whether the video signals contain the auxiliary data.

4. A system as set forth in claim 2, wherein the
receiving of the video signals on the decoding box is
5 through hardwiring or optics.

5. A system as set forth in claim 2, wherein the
decoding box is a sleeve, a cradle, a remote control, or
a docking station.

10

6. In a system utilizing a hand-held device for deriving
benefit from a production of composite video signals
carrying auxiliary data, a system comprising:

15 means for receiving the composite video signals,

means for determining whether the auxiliary data is
present in the composite video signals,

20 means for processing the auxiliary data when present, and

means for providing indicia of the auxiliary data is
present by which a user of the hand-held device may
receive tangible benefits according to content of the
25 encoded data when present.

7. In a system as set forth in claim 6, the hand-held
device further comprises means on the hand-held device
for storing the auxiliary data and for displaying at
30 least a part of the auxiliary data as said indicia.

8. In a system as set forth in claim 6, the hand-held
device further comprises means for transferring at least
a part of the auxiliary data or composite video signals
35 to a computer.

9. In a system as set forth in claim 6, wherein the

auxiliary data is provided at a rate which is a function of normal horizontal retrace frequency of a display by which the normal programming content is displayed.

5 10. In a system as set forth in claim 9, wherein the means for electronically determining whether the auxiliary data is present in the composite video signals comprises a discriminator circuit of the hand-held device responsive to both signals at the normal horizontal
10 retrace frequency and signals at a function of the normal horizontal retrace frequency and discriminating between such signals according to their relative magnitude.

11. In a system as set forth in claim 8, wherein a
15 discriminator is implemented by the computer, the discriminator generally to discriminate between the auxiliary data and signals normally characteristic of the composite video signals.

20 12. In a system as set forth in claim 6, wherein the means for receiving auxiliary data on the hand-held device comprises a photosensor and circuit means for providing an amplified and conditioned output of the photosensor to the discriminator.

25 13. In a system as set forth in claim 6, further comprising an FM receiver of the hand-held device for receiving FM transmissions providing the same content as the composite video signals when composite video signals
30 cannot be received by the hand-held device.

14. In a system as set forth in claim 13, further comprising means for selectively initiating operation of the FM receiver when composite video signals cannot be
35 received by the hand-held device.

15. In a system as set forth in claim 6, wherein the means for providing indicia of the auxiliary data is present comprises at least one display on the hand-held device.
- 5
16. In a system as set forth in claim 6, wherein the hand-held device comprises an instrument of approximately credit-card or wallet size.
- 10
17. In a system as set forth in claim 6, wherein the hand-held device comprises an instrument of approximately mobile phone or PDA size.
18. A system as set forth in claim 6, wherein the display comprises any number of light emitting display devices.
- 15
19. A system as set forth in claim 6, wherein the display comprises an alphanumeric display visible on a surface of the hand-held device.
- 20
20. In a system as set forth in claim 6, wherein the means for providing indicia of the encoded data is present comprises at least one audio transducer of the hand-held device.
- 25
21. In a system as set forth in claim 6, the hand-held device further comprises an aiming light which turns on to notify user when video signals are being received by the hand-held device.
- 30
22. In a system as set forth in claim 6, the hand-held device further comprises an activation control selectively operable to activate the hand-held device for operation.
- 35
23. In a system as set forth in claim 6, the hand-held

device further comprises a reset control selectively operable to reset the hand-held device for further operation.

- 5 24. A system for deriving benefit from auxiliary data in modulated video signals by use of a hand-held device responsive to the auxiliary data, said system carrying out the steps of:
- 10 modulating video signals to carry auxiliary data to a location of a user by means of a display device;
- receiving the video signals by means of the hand-held device;
- 15 determining whether the video signals contain auxiliary data;
- providing a benefit to the user resulting from
- 20 electronically determining that the video signals contains the auxiliary data.
- 25 25. A system as set forth in claim 24, further comprising transferring the auxiliary data through a transfer interface to a computer or computer-like device after determining whether the video signals contain auxiliary data.
- 30 26. A system as set forth in claim 24, further comprising transferring the auxiliary data through a transfer interface to a computer or computer-like device before determining whether the video signals contain auxiliary data.
- 35 27. A system as set forth in claim 24, wherein the method of modulation auxiliary data utilizes the vertical blanking interval (VBI), luminance/chrominance

modulation, signal replacement, signal addition, and/or separate signal.

28. A method of video interactive advertising and
5 promotion, comprising

transmitting auxiliary data by television together with
normally visible television programming content, where
the auxiliary data is associated with a sponsor and
10 carries information of special significance relative to
the sponsor and of special value to television viewers,

distributing interactive devices of hand-held character
to television viewers for their use, the devices being
15 capable of selectively receiving the auxiliary data,

providing incentive for viewers to use the interactive
devices for selectively receiving and decoding the
auxiliary data by rewarding the viewers with the
20 information of special value, the interactive devices
being capable of retaining indication of having received
the information, and

providing redemption of the special value for users at a
25 redemption site where users may present the interactive
devices.

29. A method of interactive advertising and promotion in
connection with a sports event or other special event,
30 comprising

transmitting auxiliary data by television together with
normally visible television programming content related
to such event, where the auxiliary data is associated
35 with a sponsor and carry information special significance
relative to the event, the sponsor and are of special
value to viewers,

providing means for television viewers to use a hand-held device at an event for their use, the devices being capable of selectively receiving the auxiliary data, and

5

providing incentive for viewers to use the hand-held devices for selectively receiving the auxiliary data by rewarding the viewers with the information of special value, the interactive devices being capable of retaining

10 indication of having received the information, and

using the devices to display for the benefit of users information received by means of the auxiliary data.

15 30. A method of interactive advertising and promotion in connection with a sporting, racing, or other special event, comprising

transmitting auxiliary data by television together with
20 normally visible television programming content related to such event, where the auxiliary data is associated with a sponsor and carry information special significance relative to at least one of the participants in the event, the sponsor and are of special value to viewers,

25

providing means for television viewers to use a hand-held device at an event for their use, the devices being capable of selectively receiving the auxiliary data, and

30 providing incentive for viewers to use the interactive devices for selectively receiving and decoding the auxiliary data by rewarding the viewers with the information of special value, the interactive devices being capable of retaining indication of having received
35 the information, and

using the devices to display for the benefit of the users information received by means of the auxiliary data.

31. A method of using auxiliary data if present with
5 television programming normally viewable by television viewers, where the auxiliary data is transparent to the viewers may accompany the television programming, displaying the television programming on a display device, receiving light signals from the display device
10 by use of a hand-held device where the light signals include auxiliary data if present, by photosensing the light signals at the hand-held device, filtering and amplifying the light signals within the hand-held device, using a discriminator within the hand-held device to
15 determine whether the auxiliary data is present in the amplified light signals, and providing the auxiliary data for further use by the hand-held device.

32. A method of using auxiliary data according to claim
20 31 including the steps of providing the auxiliary data to a microprocessor of the hand-held device and displaying information content of the auxiliary data by means of a display of the hand-held device in response to operation of microprocessor.

25 33. A method of using auxiliary data according to claim 31 wherein the display is an alphanumeric display or one or more a light-emitting display devices.

30 34. A method of using auxiliary data if present with television programming normally viewable by television viewers, where the auxiliary data is transparent to the viewers and may accompany the television programming, receiving modulated video signals from the display device
35 by use of a decoder box where the video signals include auxiliary data if present, filtering and amplifying the light signals within the decoder box, using a

discriminator within the decoder box to determine whether the auxiliary data is present in the amplified light signals, and providing the auxiliary data for further use by the hand-held device.

5

35. A method for viewing Internet websites, comprising producing video signals encoded with auxiliary data at a location of a user by means of a hand-held device, comprising:

10

providing the user with the means on a hand-held device for receiving the video signals;

15

receiving the auxiliary data by means of the hand-held device;

transferring said auxiliary data through a connection from the hand-held device to a computer; and

20

utilizing the auxiliary data on the computer.

36. The method of claim 35, wherein utilizing the auxiliary data on the computer is constituted by executing a computer program on the computer.

25

37. The method of claim 35, wherein utilizing the auxiliary data on the computer is locating an Internet website from the indicia of the auxiliary data.

30

38. A method of providing improved advertising opportunities in a movie theater by the use of a hand-held device by a movie patron, said method comprising:
entering a movie screening area by the movie patron;
35 receiving auxiliary data on a hand-held device;
recording a response by the movie patron to the received auxiliary data; and

processing the response.

39. An electronic multi-use card for the redemption of electronic coupons and value, said electronic multi-use card comprising:
- a microprocessor embedded in said card;
 - memory electronically connected to said microprocessor;
 - visual display electronically connected to said microprocessor and said memory;
 - user interaction means electronically connected to said microprocessor, said memory, and said visual display;
 - a photodetector, said photodetector electronically coupled to said microprocessor and said memory, said photodetector capable of detecting light from a conventional bar code scanner; and
 - laser detection triggering means electronically coupled to said photodetector.
40. A method for the redemption of electronic coupons and value, said method comprising the steps of:
- providing an electronic multi-use card, said electronic multi-use card having a visual display means and a photodetector;
 - pointing said electronic multi-use card at a video display;
 - reception of electronic value data by said electronic multi-use card from said video display;
 - storing of said electronic value data on said electronic multi-use card;
 - transporting said electronic multi-use card to a point of sale, said point of sale having a computer system;
 - viewing said electronic value data in said visual display means and simultaneously scanning said photodetector with a light scanner; and
 - entering said electronic value data into the

computer system of said point of sale.

FIG. 1

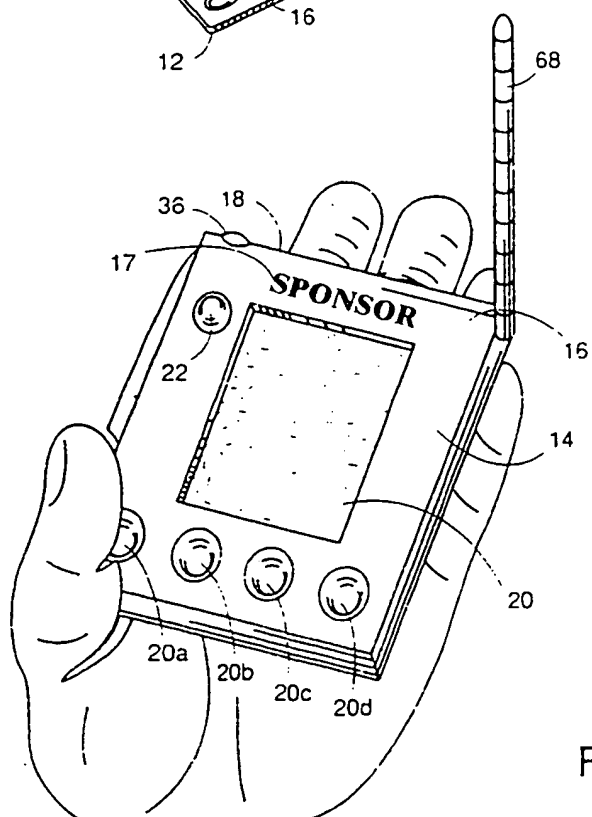
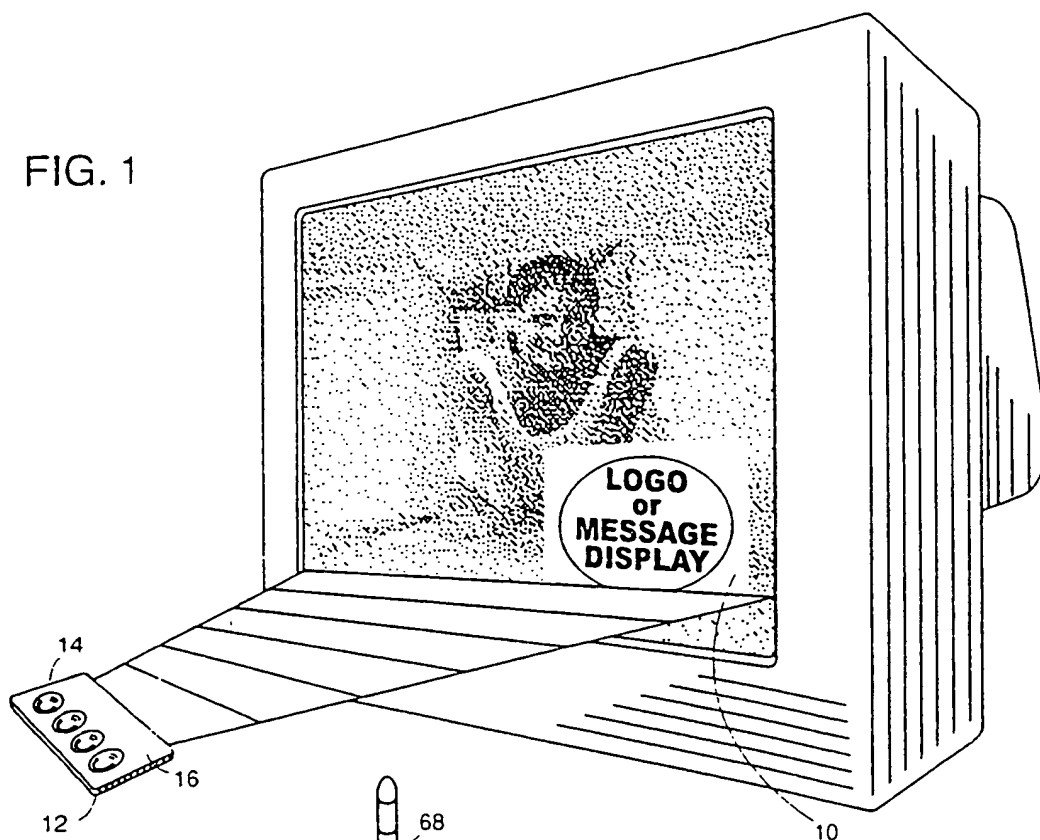


FIG. 2A

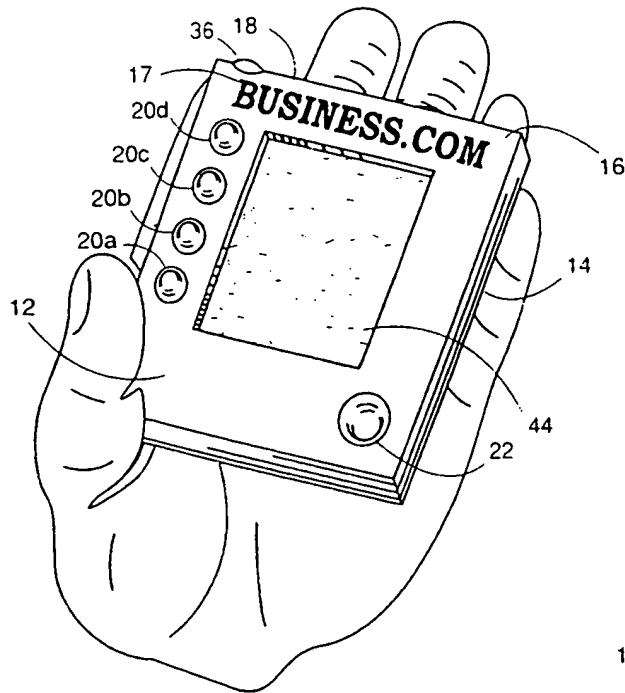


FIG. 2B

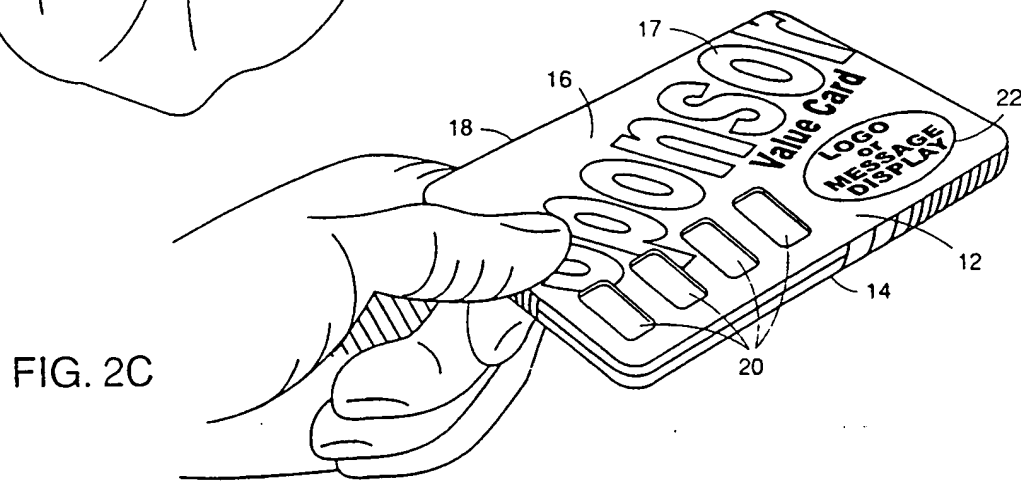


FIG. 2C

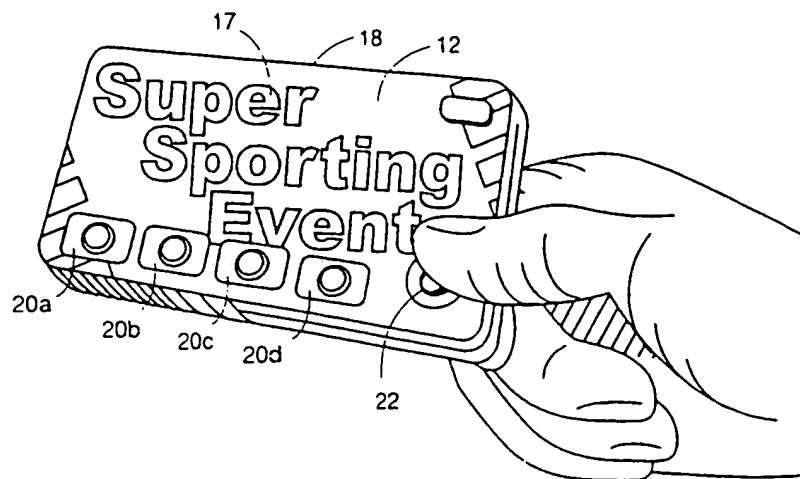


FIG. 3

FIG. 4

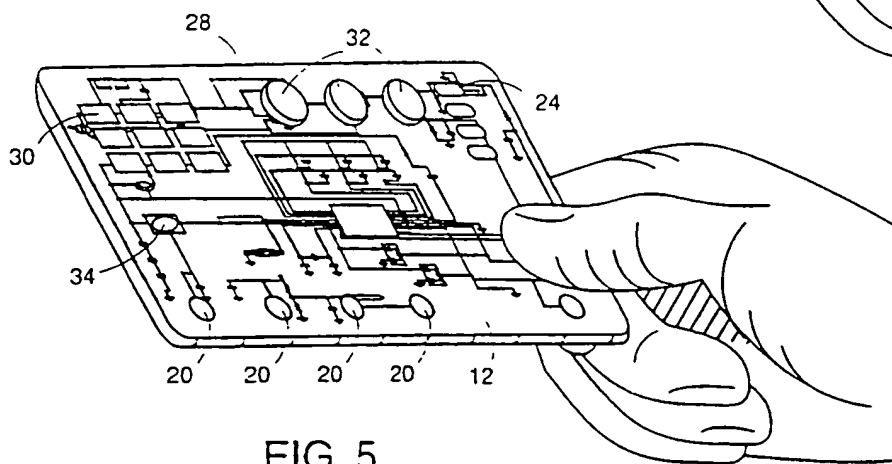
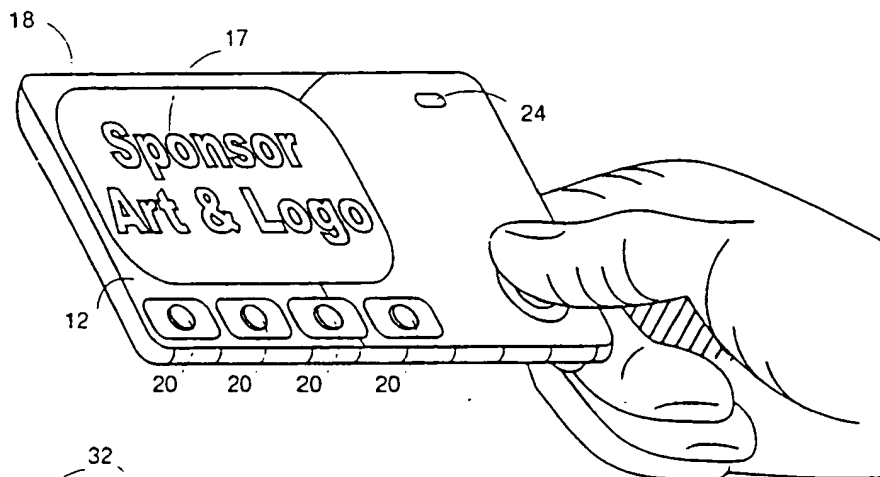
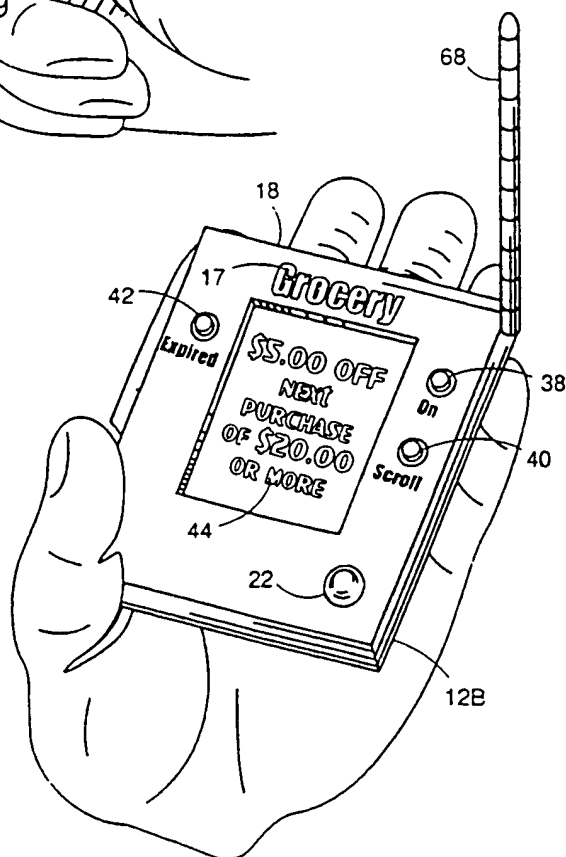


FIG. 5

FIG. 6



Optical Receipt With PCMCIA Computer Connection

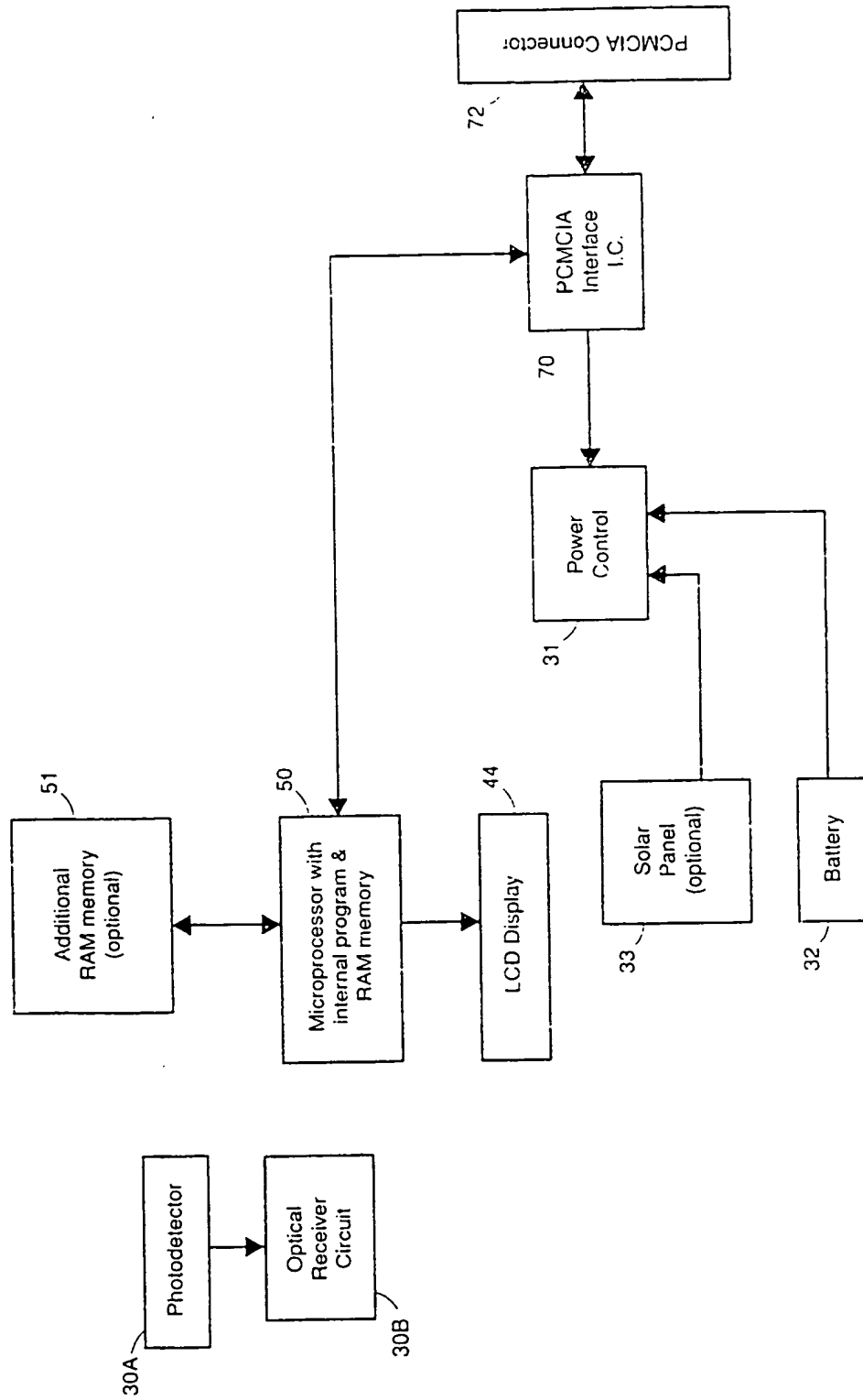


FIG. 8

Hard Wired Receipt With PCMCIA Interface – PCMCIA Card

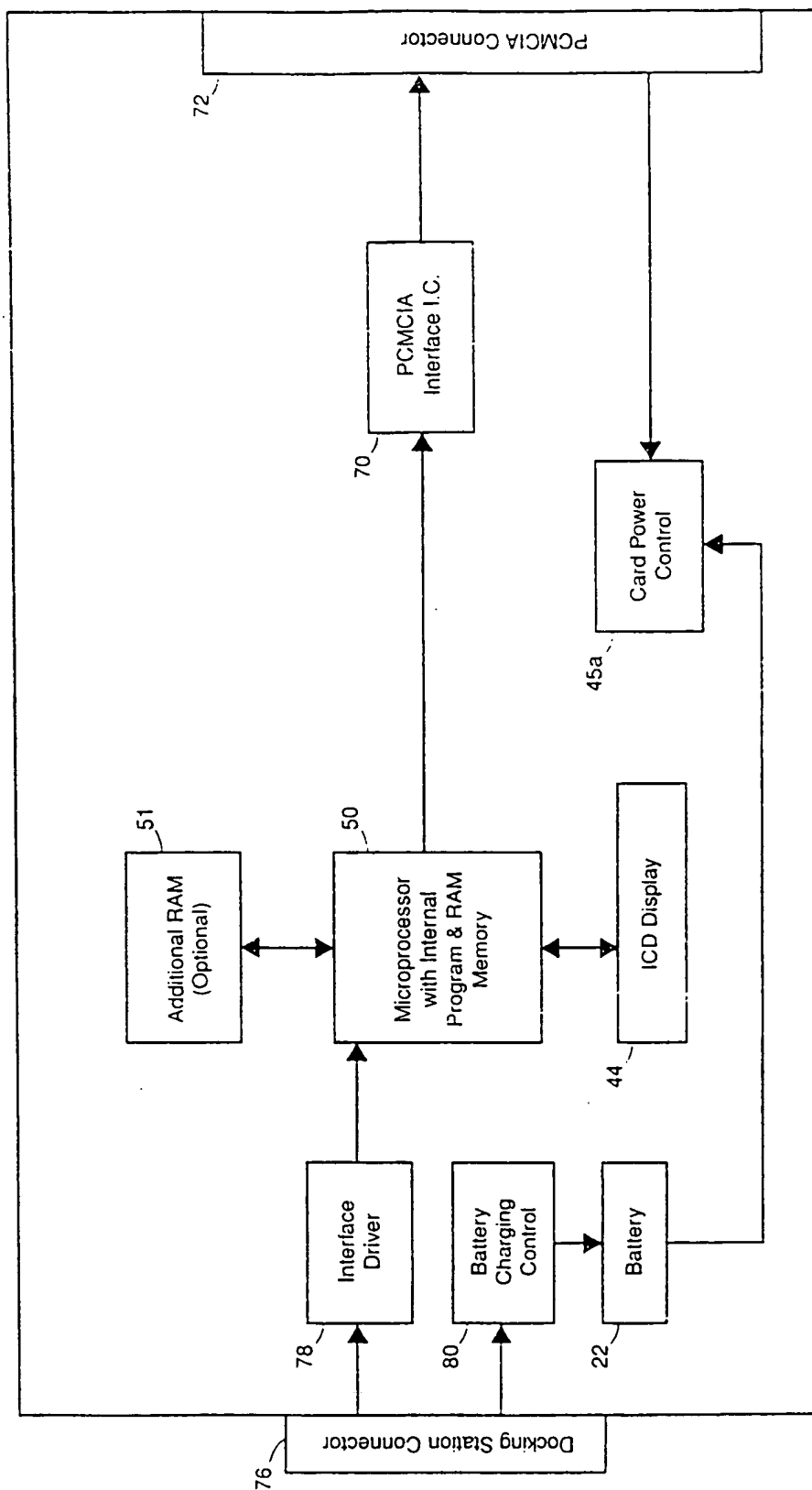


FIG. 9

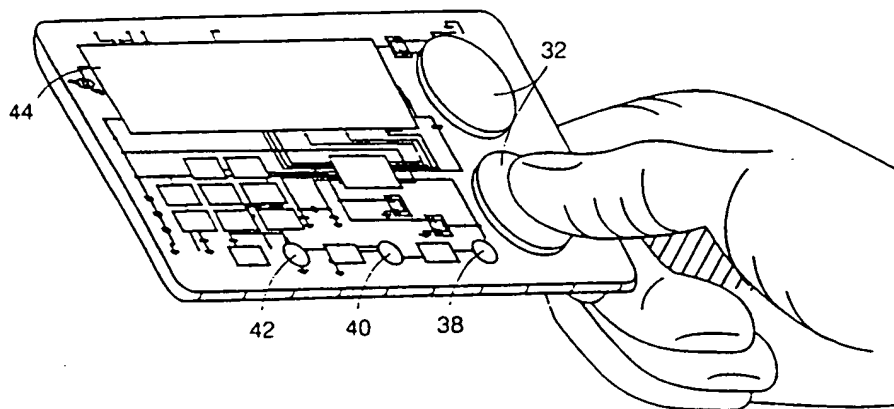


FIG. 7

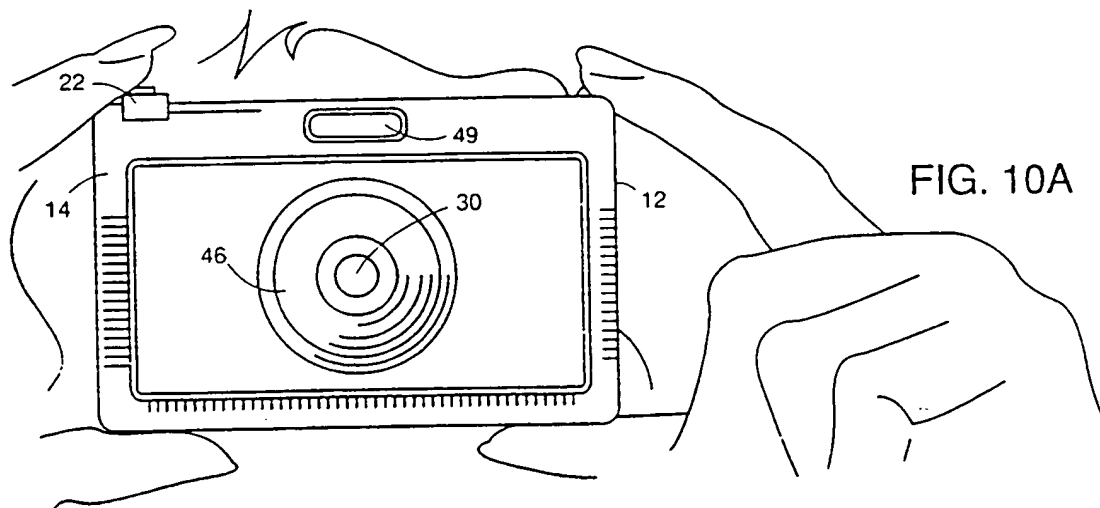


FIG. 10A

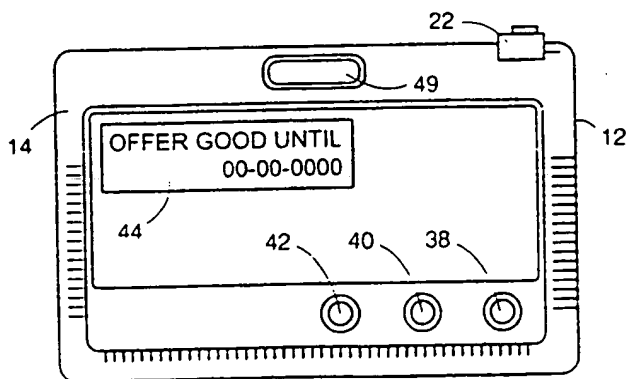


FIG. 10B

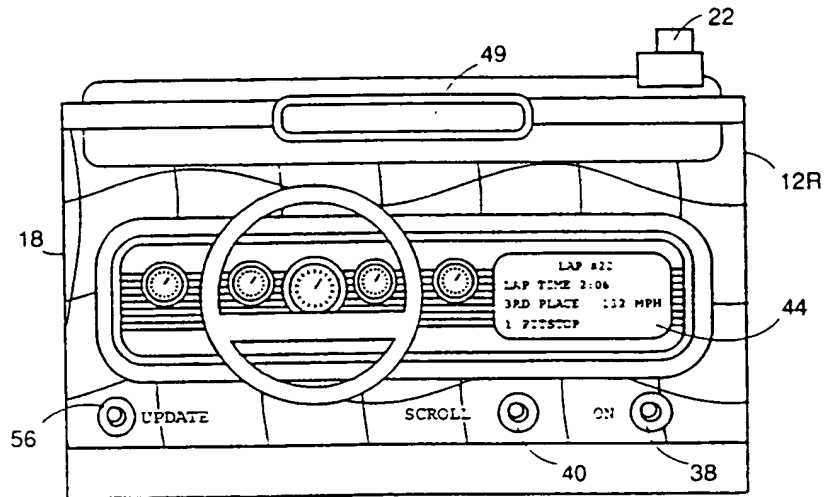


FIG. 11B

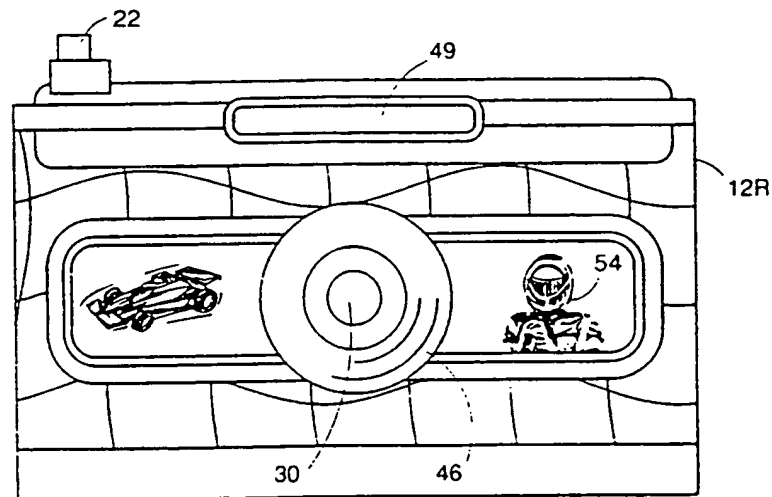


FIG. 11A

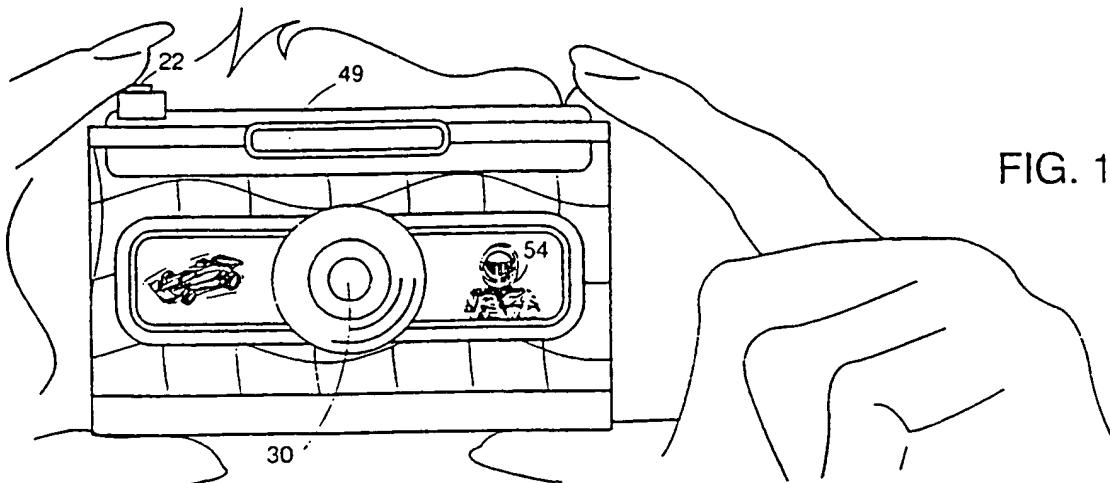


FIG. 11C

FIG.13E

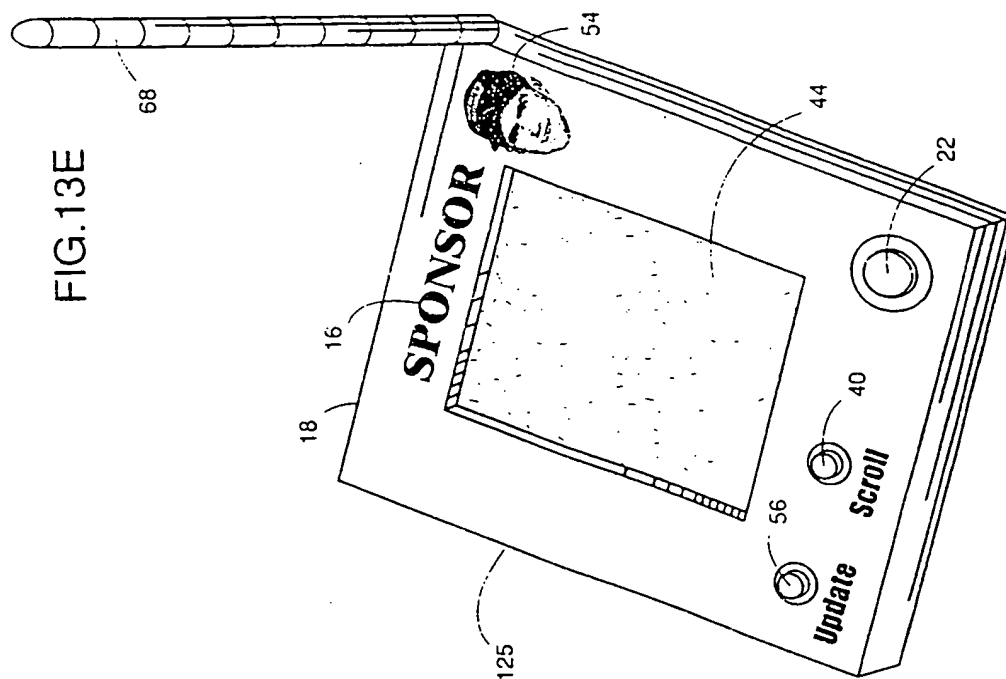


FIG.13B

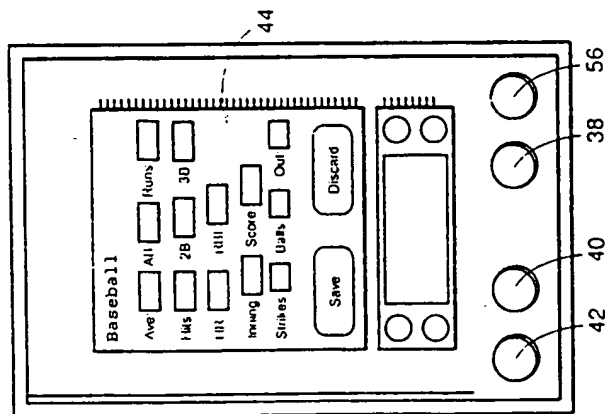
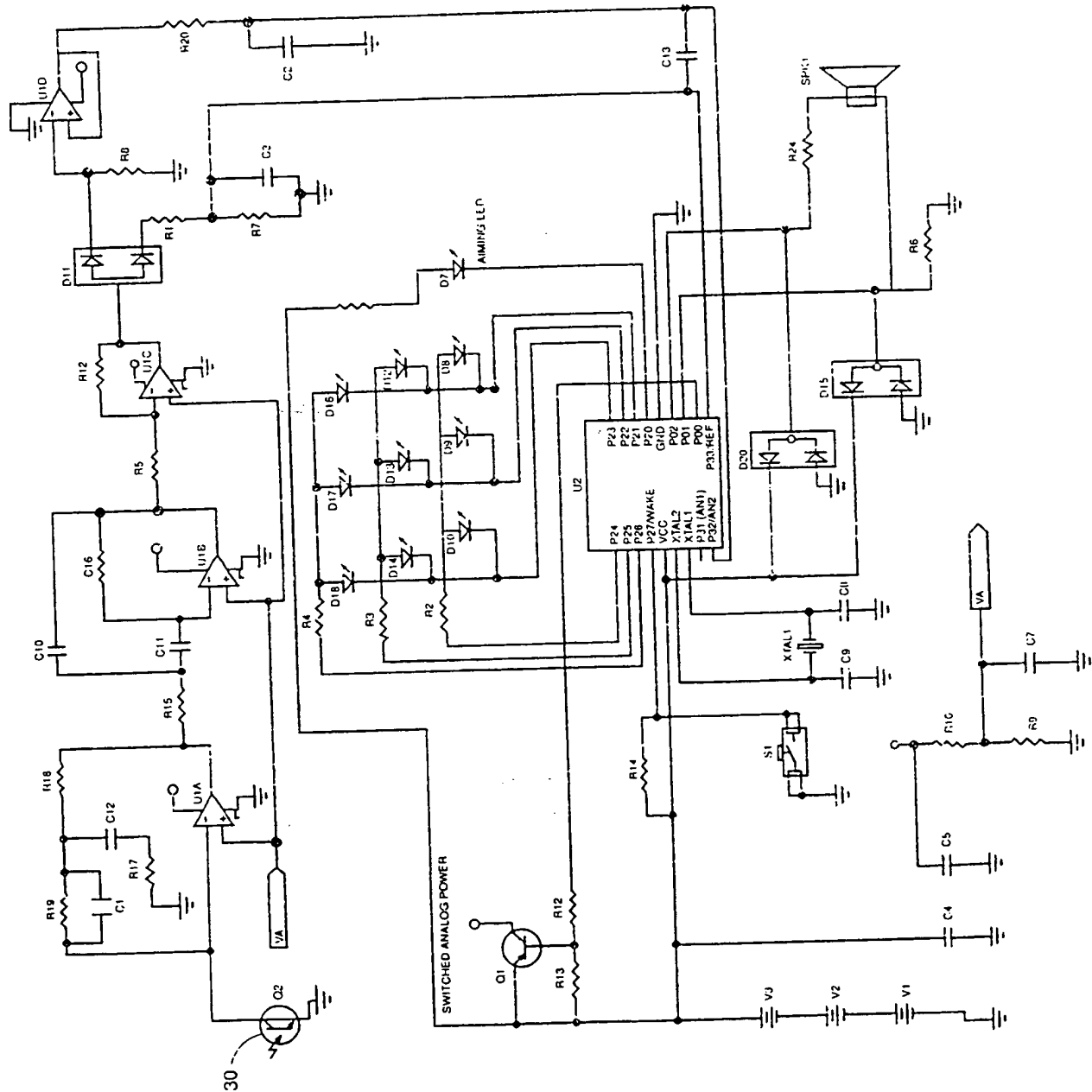


FIG.14



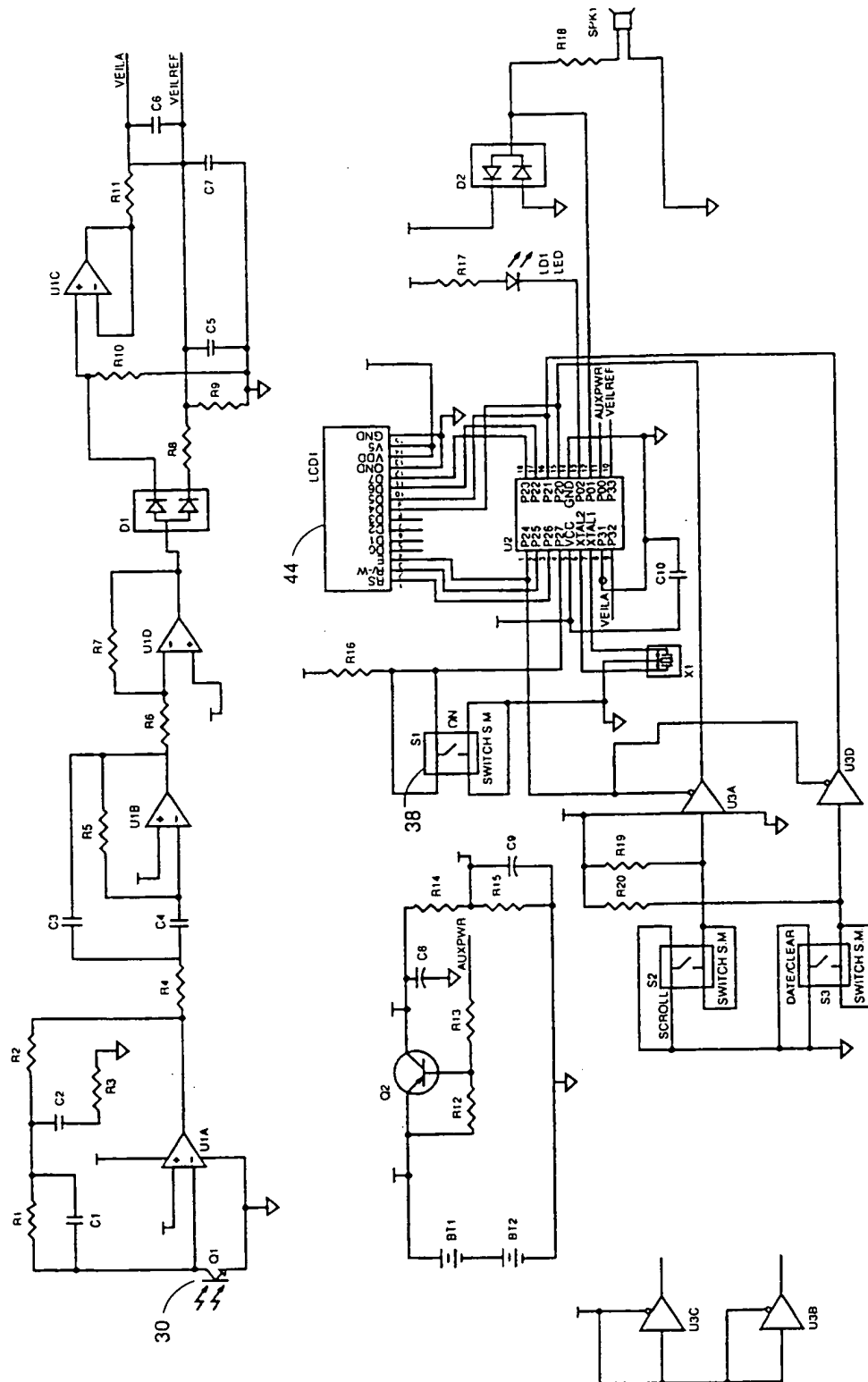


FIG. 15

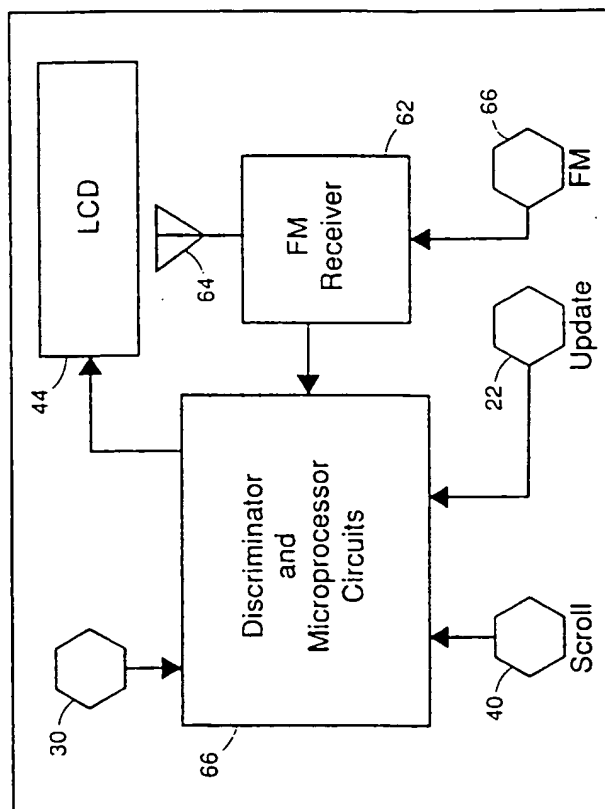


FIG.16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/24386

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H04N 7/173

US CL : 725/23

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 725/23, 32-36, 135-142, 153; 345/327; 705/14; H04N 7/16, 7/173

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,767,896 A (NEMIROFSKY) 16 June 1998 whole document	1-40
X	US 5,523,794 A (MANKOVITZ et al.) 04 June 1996 whole document	1-40
X	US 5,249,044 A (VON KOHORN) 28 September 1993 whole document	1-40
A	US 5,500,681 A (JONES) 19 March 1996 whole document	1-40
A	US 5,488,423 A (WALKINGSHAW et al.) 30 January 1996 whole document	1-40

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Z* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

03 JANUARY 2001

Date of mailing of the international search report

22 JAN 2001

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

CHRISTOPHER GRAY

Telephone No. (703) 305-4755

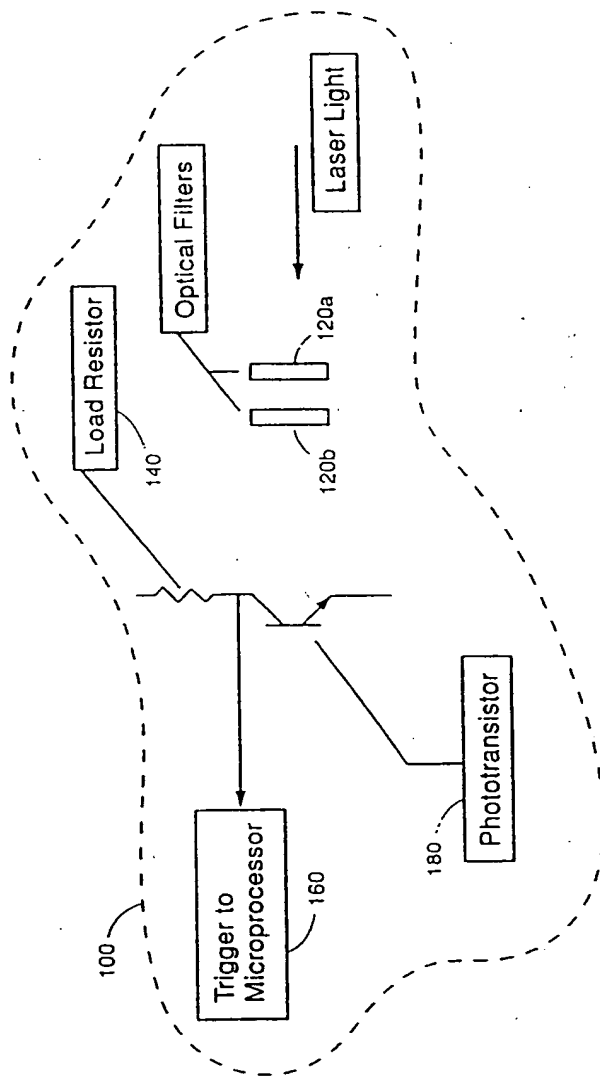


FIG.17